



T81-558: Applications of Deep Neural Networks

Module 12: Reinforcement Learning

- Instructor: [Jeff Heaton](#), McKelvey School of Engineering, [Washington University in St. Louis](#)
- For more information visit the [class website](#).

Module 12 Video Material

- **Part 12.1: Introduction to the OpenAI Gym** [\[Video\]](#) [\[Notebook\]](#)
- Part 12.2: Introduction to Q-Learning [\[Video\]](#) [\[Notebook\]](#)
- Part 12.3: Keras Q-Learning in the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
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- Part 12.5: Application of Reinforcement Learning [\[Video\]](#) [\[Notebook\]](#)

Part 12.1: Introduction to the OpenAI Gym

[OpenAI Gym](#) aims to provide an easy-to-setup general-intelligence benchmark with various environments. The goal is to standardize how environments are defined in AI research publications to make published research more easily reproducible. The project claims to provide the user with a simple interface. As of June 2017, developers can only use Gym with Python.

OpenAI gym is pip-installed onto your local machine. There are a few significant limitations to be aware of:

- OpenAI Gym Atari only **directly** supports Linux and Macintosh
- OpenAI Gym Atari can be used with Windows; however, it requires a particular [installation procedure](#)
- OpenAI Gym can not directly render animated games in Google CoLab.

Because OpenAI Gym requires a graphics display, an embedded video is the only way to display Gym in Google CoLab. The presentation of OpenAI Gym game animations in Google CoLab is discussed later in this module.

OpenAI Gym Leaderboard

The OpenAI Gym does have a leaderboard, similar to Kaggle; however, the OpenAI Gym's leaderboard is much more informal compared to Kaggle. The user's local machine performs all scoring. As a result, the OpenAI gym's leaderboard is strictly an "honor system." The leaderboard is maintained in the following GitHub repository:

- [OpenAI Gym Leaderboard](#)

You must provide a write-up with sufficient instructions to reproduce your result if you submit a score. A video of your results is suggested but not required.

Looking at Gym Environments

The centerpiece of Gym is the environment, which defines the "game" in which your reinforcement algorithm will compete. An environment does not need to be a game; however, it describes the following game-like features:

- **action space:** What actions can we take on the environment at each step/episode to alter the environment.
- **observation space:** What is the current state of the portion of the environment that we can observe. Usually, we can see the entire environment.

Before we begin to look at Gym, it is essential to understand some of the terminology used by this library.

- **Agent** - The machine learning program or model that controls the actions. Step - One round of issuing actions that affect the observation space.
- **Episode** - A collection of steps that terminates when the agent fails to meet the environment's objective or the episode reaches the maximum number of allowed steps.
- **Render** - Gym can render one frame for display after each episode.
- **Reward** - A positive reinforcement that can occur at the end of each episode, after the agent acts.
- **Non-deterministic** - For some environments, randomness is a factor in deciding what effects actions have on reward and changes to the observation space.

It is important to note that many gym environments specify that they are not non-deterministic even though they use random numbers to process actions. Based on the gym GitHub issue tracker, a non-deterministic property means a deterministic environment behaves randomly. Even when you give the environment a consistent seed value, this behavior is confirmed. The program can use the seed method of an environment to seed the random number generator for the environment.

The Gym library allows us to query some of these attributes from environments. I created the following function to query gym environments.

```
In [1]: import gym

def query_environment(name):
    env = gym.make(name)
    spec = gym.spec(name)
    print(f"Action Space: {env.action_space}")
    print(f"Observation Space: {env.observation_space}")
    print(f"Max Episode Steps: {spec.max_episode_steps}")
    print(f"Nondeterministic: {spec.nondeterministic}")
    print(f"Reward Range: {env.reward_range}")
    print(f"Reward Threshold: {spec.reward_threshold}")
```

We will look at the **MountainCar-v0** environment, which challenges an underpowered car to escape the valley between two mountains. The following code describes the Mountain Car environment.

```
In [2]: query_environment("MountainCar-v0")
```

```
Action Space: Discrete(3)
Observation Space: Box(-1.2000000476837158, 0.6000000238418579, (2,), float32)
Max Episode Steps: 200
Nondeterministic: False
Reward Range: (-inf, inf)
Reward Threshold: -110.0
```

This environment allows three distinct actions: accelerate forward, decelerate, or backward. The observation space contains two continuous (floating point) values, as evident by the box object. The observation space is simply the position and velocity of the car. The car has 200 steps to escape for each episode. You would have to look at the code, but the mountain car receives no incremental reward. The only reward for the vehicle occurs when it escapes the valley.

```
In [3]: query_environment("CartPole-v1")
```

```
Action Space: Discrete(2)
Observation Space: Box(-3.4028234663852886e+38, 3.4028234663852886e+38, (4,), float32)
Max Episode Steps: 500
Nondeterministic: False
Reward Range: (-inf, inf)
Reward Threshold: 475.0
```

The **CartPole-v1** environment challenges the agent to balance a pole while the agent. The environment has an observation space of 4 continuous numbers:

- Cart Position
- Cart Velocity

- Pole Angle
- Pole Velocity At Tip

To achieve this goal, the agent can take the following actions:

- Push cart to the left
- Push cart to the right

There is also a continuous variant of the mountain car. This version does not simply have the motor on or off. The action space is a single floating-point number for the continuous cart that specifies how much forward or backward force the cart currently utilizes.

```
In [4]: query_environment("MountainCarContinuous-v0")
```

```
Action Space: Box(-1.0, 1.0, (1,), float32)
Observation Space: Box(-1.2000000476837158, 0.6000000238418579, (2,), float32)
Max Episode Steps: 999
Nondeterministic: False
Reward Range: (-inf, inf)
Reward Threshold: 90.0
```

Note: If you see a warning above, you can safely ignore it; it is a relatively minor bug in OpenAI Gym.

Atari games, like breakout, can use an observation space that is either equal to the size of the Atari screen (210x160) or even use the RAM of the Atari (128 bytes) to determine the state of the game. Yes, that's bytes, not kilobytes!

```
In [5]: # HIDE OUTPUT
```

```
!wget http://www.atarimania.com/roms/Roms.rar
!unrar x -o+ /content/Roms.rar >/dev/nul
!python -m atari_py.import_roms /content/ROMS >/dev/nul
```

```
--2022-04-02 16:20:06-- http://www.atarimania.com/roms/Roms.rar
Resolving www.atarimania.com (www.atarimania.com)... 195.154.81.199
Connecting to www.atarimania.com (www.atarimania.com)|195.154.81.199|:80...
connected.
HTTP request sent, awaiting response... 200 OK
Length: 19583716 (19M) [application/x-rar-compressed]
Saving to: 'Roms.rar'
```

```
Roms.rar          100%[=====>]  18.68M  474KB/s   in 42s
```

```
2022-04-02 16:20:49 (456 KB/s) - 'Roms.rar' saved [19583716/19583716]
```

```
In [6]: query_environment("Breakout-v0")
```

```
Action Space: Discrete(4)
Observation Space: Box(0, 255, (210, 160, 3), uint8)
Max Episode Steps: 10000
Nondeterministic: False
Reward Range: (-inf, inf)
Reward Threshold: None
```

```
In [7]: query_environment("Breakout-ram-v0")
```

```
Action Space: Discrete(4)
Observation Space: Box(0, 255, (128,), uint8)
Max Episode Steps: 10000
Nondeterministic: False
Reward Range: (-inf, inf)
Reward Threshold: None
```

Render OpenAI Gym Environments from CoLab

It is possible to visualize the game your agent is playing, even on CoLab. This section provides information on generating a video in CoLab that shows you an episode of the game your agent is playing. I based this video process on suggestions found [here](#).

Begin by installing **pyvirtualdisplay** and **python-opengl**.

```
In [8]: # HIDE OUTPUT
!pip install gym pyvirtualdisplay > /dev/null 2>&1
!apt-get install -y xvfb python-opengl ffmpeg > /dev/null 2>&1
```

Next, we install the needed requirements to display an Atari game.

```
In [9]: # HIDE OUTPUT
!apt-get update > /dev/null 2>&1
!apt-get install cmake > /dev/null 2>&1
!pip install --upgrade setuptools > /dev/null 2>&1
!pip install ez_setup > /dev/null 2>&1
!pip install gym[atari] > /dev/null 2>&1
```

Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-packages (57.4.0)

Collecting setuptools

Downloading setuptools-61.3.1-py3-none-any.whl (1.1 MB)

|██| 1.1 MB 7.8 MB/s

Installing collected packages: setuptools

Attempting uninstall: setuptools

Found existing installation: setuptools 57.4.0

Uninstalling setuptools-57.4.0:

Successfully uninstalled setuptools-57.4.0

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

tensorflow 2.8.0 requires tf-estimator-nightly==2.8.0.dev2021122109, which is not installed.

datascience 0.10.6 requires folium==0.2.1, but you have folium 0.8.3 which is incompatible.

Successfully installed setuptools-61.3.1

Next, we define the functions used to show the video by adding it to the CoLab notebook.

```
In [10]: import gym
from gym.wrappers import Monitor
import glob
import io
import base64
from IPython.display import HTML
from pyvirtualdisplay import Display
from IPython import display as ipythondisplay

display = Display(visible=0, size=(1400, 900))
display.start()

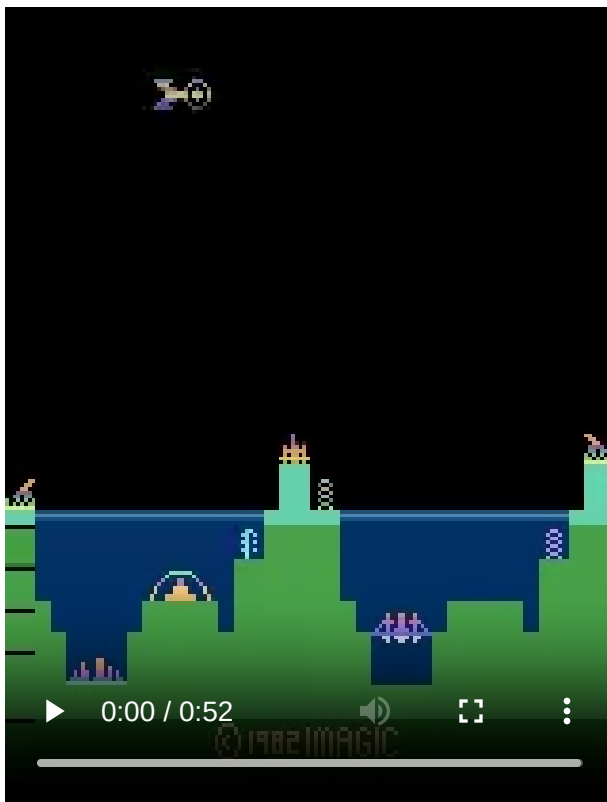
"""
Utility functions to enable video recording of gym environment
and displaying it.
To enable video, just do "env = wrap_env(env)"
"""

def show_video():
    mp4list = glob.glob('video/*.mp4')
    if len(mp4list) > 0:
        mp4 = mp4list[0]
        video = io.open(mp4, 'r+b').read()
        encoded = base64.b64encode(video)
        ipythondisplay.display(HTML(data='''<video alt="test" autoplay
            loop controls style="height: 400px;">
            <source src="data:video/mp4;base64,{0}" type="video/mp4" />
            </video>'''.format(encoded.decode('ascii'))))
    else:
        print("Could not find video")
```

```
def wrap_env(env):  
    env = Monitor(env, './video', force=True)  
    return env
```

Now we are ready to play the game. We use a simple random agent.

```
In [11]: # HIDE OUTPUT  
#env = wrap_env(gym.make("MountainCar-v0"))  
env = wrap_env(gym.make("Atlantis-v0"))  
  
observation = env.reset()  
  
while True:  
  
    env.render()  
  
    # your agent goes here  
    action = env.action_space.sample()  
  
    observation, reward, done, info = env.step(action)  
  
    if done:  
        break  
  
env.close()  
show_video()
```





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Google CoLab Instructions

The following code ensures that Google CoLab is running the correct version of TensorFlow.

```
In [1]: try:
        from google.colab import drive
        %tensorflow_version 2.x
        COLAB = True
        print("Note: using Google CoLab")
    except:
        print("Note: not using Google CoLab")
        COLAB = False
```

Note: using Google CoLab

```
In [2]: # HIDE OUTPUT
        if COLAB:
            !sudo apt-get install -y xvfb ffmpeg x11-utils
            !pip install -q gym
            !pip install -q 'imageio==2.4.0'
            !pip install -q PILLOW
            !pip install -q 'pyglet==1.3.2'
            !pip install -q pyvirtualdisplay
```



```
!pip install -q tf-agents  
!pip install -q pygame
```

```

Reading package lists... Done
Building dependency tree
Reading state information... Done
ffmpeg is already the newest version (7:3.4.8-0ubuntu0.2).
Suggested packages:
  mesa-utils
The following NEW packages will be installed:
  libxxf86dga1 x11-utils xvfb
0 upgraded, 3 newly installed, 0 to remove and 39 not upgraded.
Need to get 993 kB of archives.
After this operation, 2,982 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu bionic/main amd64 libxxf86dga1 amd64
2:1.1.4-1 [13.7 kB]
Get:2 http://archive.ubuntu.com/ubuntu bionic/main amd64 x11-utils amd64 7.7
+3build1 [196 kB]
Get:3 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 xvfb am
d64 2:1.19.6-1ubuntu4.10 [784 kB]
Fetched 993 kB in 1s (1,252 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based fr
ontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 7
6, <=> line 3.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package libxxf86dga1:amd64.
(Reading database ... 156210 files and directories currently installed.)
Preparing to unpack .../libxxf86dga1_2%3a1.1.4-1_amd64.deb ...
Unpacking libxxf86dga1:amd64 (2:1.1.4-1) ...
Selecting previously unselected package x11-utils.
Preparing to unpack .../x11-utils_7.7+3build1_amd64.deb ...
Unpacking x11-utils (7.7+3build1) ...
Selecting previously unselected package xvfb.
Preparing to unpack .../xvfb_2%3a1.19.6-1ubuntu4.10_amd64.deb ...
Unpacking xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up libxxf86dga1:amd64 (2:1.1.4-1) ...
Setting up x11-utils (7.7+3build1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.3) ...
/sbin/ldconfig.real: /usr/local/lib/python3.7/dist-packages/ideep4py/lib/lib
mkldnn.so.0 is not a symbolic link

```

```

|████████████████████████████████████████| 3.3 MB 5.1 MB/s
Building wheel for imageio (setup.py) ... done
ERROR: pip's dependency resolver does not currently take into account all th
e packages that are installed. This behaviour is the source of the following
dependency conflicts.
albumations 0.1.12 requires imgaug<0.2.7,>=0.2.5, but you have imgaug 0.
2.9 which is incompatible.
|████████████████████████████████████████| 1.0 MB 5.2 MB/s
ERROR: pip's dependency resolver does not currently take into account all th
e packages that are installed. This behaviour is the source of the following
dependency conflicts.

```

gym 0.17.3 requires pygame<=1.5.0,>=1.4.0, but you have pygame 1.3.2 which is incompatible.

		1.3 MB	5.0 MB/s
		1.0 MB	29.8 MB/s
		21.8 MB	1.2 MB/s

Part 12.2: Introduction to Q-Learning

Q-Learning is a foundational technology upon which deep reinforcement learning is based. Before we explore deep reinforcement learning, it is essential to understand Q-Learning. Several components make up any Q-Learning system.

- **Agent** - The agent is an entity that exists in an environment that takes actions to affect the state of the environment, to receive rewards.
- **Environment** - The environment is the universe that the agent exists in. The environment is always in a specific state that is changed by the agent's actions.
- **Actions** - Steps that the agent can perform to alter the environment
- **Step** - A step occurs when the agent performs an action and potentially changes the environment state.
- **Episode** - A chain of steps that ultimately culminates in the environment entering a terminal state.
- **Epoch** - A training iteration of the agent that contains some number of episodes.
- **Terminal State** - A state in which further actions do not make sense. A terminal state occurs when the agent has one, lost, or the environment exceeds the maximum number of steps in many environments.

Q-Learning works by building a table that suggests an action for every possible state. This approach runs into several problems. First, the environment is usually composed of several continuous numbers, resulting in an infinite number of states. Q-Learning handles continuous states by binning these numeric values into ranges.

Out of the box, Q-Learning does not deal with continuous inputs, such as a car's accelerator that can range from released to fully engaged. Additionally, Q-Learning primarily deals with discrete actions, such as pressing a joystick up or down. Researchers have developed clever tricks to allow Q-Learning to accommodate continuous actions.

Deep neural networks can help solve the problems of continuous environments and action spaces. In the next section, we will learn more about deep reinforcement learning. For now, we will apply regular Q-Learning to the Mountain Car problem from OpenAI Gym.

Introducing the Mountain Car

This section will demonstrate how Q-Learning can create a solution to the mountain car gym environment. The Mountain car is an environment where a car must climb a mountain. Because gravity is stronger than the car's engine, it cannot merely accelerate up the steep slope even with full throttle. The vehicle is situated in a valley and must learn to utilize potential energy by driving up the opposite hill before the car can make it to the goal at the top of the rightmost hill.

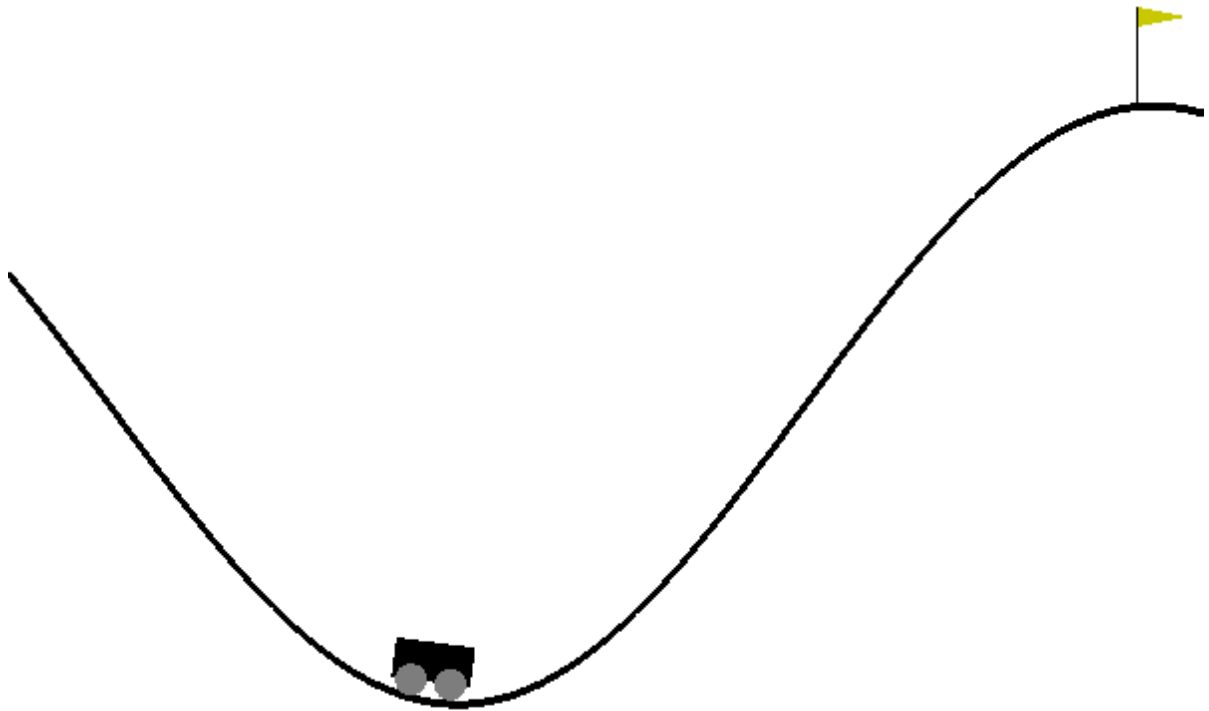
First, it might be helpful to visualize the mountain car environment. The following code shows this environment. This code makes use of TF-Agents to perform this render. Usually, we use TF-Agents for the type of deep reinforcement learning that we will see in the next module. However, TF-Agents is just used to render the mountain care environment for now.

```
In [3]: import tf_agents
from tf_agents.environments import suite_gym
import PIL.Image
import pyvirtualdisplay

display = pyvirtualdisplay.Display(visible=0, size=(1400, 900)).start()

env_name = 'MountainCar-v0'
env = suite_gym.load(env_name)
env.reset()
PIL.Image.fromarray(env.render())
```

Out[3]:



The mountain car environment provides the following discrete actions:

- 0 - Apply left force

- 1 - Apply no force
- 2 - Apply right force

The mountain car environment is made up of the following continuous values:

- state[0] - Position
- state[1] - Velocity

The cart is not strong enough. It will need to use potential energy from the mountain behind it. The following code shows an agent that applies full throttle to climb the hill.

```
In [4]: import gym
from gym.wrappers import Monitor
import glob
import io
import base64
from IPython.display import HTML
from pyvirtualdisplay import Display
from IPython import display as ipythondisplay

display = Display(visible=0, size=(1400, 900))
display.start()

def show_video():
    mp4list = glob.glob('video/*.mp4')
    if len(mp4list) > 0:
        mp4 = mp4list[0]
        video = io.open(mp4, 'r+b').read()
        encoded = base64.b64encode(video)
        ipythondisplay.display(HTML(data='''<video alt="test" autoplay
            loop controls style="height: 400px;">
            <source src="data:video/mp4;base64,{0}"
            type="video/mp4" />
            </video>'''.format(encoded.decode('ascii'))))
    else:
        print("Could not find video")

def wrap_env(env):
    env = Monitor(env, './video', force=True)
    return env
```

We are now ready to train the agent.

```
In [5]: import gym

if COLAB:
    env = wrap_env(gym.make("MountainCar-v0"))
else:
    env = gym.make("MountainCar-v0")

env.reset()
```

```
done = False

i = 0
while not done:
    i += 1
    state, reward, done, _ = env.step(2)
    env.render()
    print(f"Step {i}: State={state}, Reward={reward}")

env.close()
```

Step 1: State=[-0.50905189 0.00089766], Reward=-1.0
Step 2: State=[-0.50726329 0.00178859], Reward=-1.0
Step 3: State=[-0.50459717 0.00266613], Reward=-1.0
Step 4: State=[-0.50107348 0.00352369], Reward=-1.0
Step 5: State=[-0.4967186 0.00435488], Reward=-1.0
Step 6: State=[-0.4915651 0.0051535], Reward=-1.0
Step 7: State=[-0.48565149 0.00591361], Reward=-1.0
Step 8: State=[-0.47902187 0.00662962], Reward=-1.0
Step 9: State=[-0.47172557 0.00729629], Reward=-1.0
Step 10: State=[-0.46381676 0.00790881], Reward=-1.0
Step 11: State=[-0.45535392 0.00846285], Reward=-1.0
Step 12: State=[-0.44639934 0.00895458], Reward=-1.0
Step 13: State=[-0.4370186 0.00938074], Reward=-1.0
Step 14: State=[-0.42727993 0.00973867], Reward=-1.0
Step 15: State=[-0.41725364 0.01002629], Reward=-1.0
Step 16: State=[-0.40701147 0.01024216], Reward=-1.0
Step 17: State=[-0.396626 0.01038548], Reward=-1.0
Step 18: State=[-0.38616995 0.01045604], Reward=-1.0
Step 19: State=[-0.37571567 0.01045428], Reward=-1.0
Step 20: State=[-0.36533449 0.01038118], Reward=-1.0
Step 21: State=[-0.35509619 0.0102383], Reward=-1.0
Step 22: State=[-0.34506852 0.01002767], Reward=-1.0
Step 23: State=[-0.33531672 0.0097518], Reward=-1.0
Step 24: State=[-0.32590314 0.00941358], Reward=-1.0
Step 25: State=[-0.31688687 0.00901627], Reward=-1.0
Step 26: State=[-0.30832346 0.00856341], Reward=-1.0
Step 27: State=[-0.30026469 0.00805876], Reward=-1.0
Step 28: State=[-0.2927584 0.00750629], Reward=-1.0
Step 29: State=[-0.2858483 0.0069101], Reward=-1.0
Step 30: State=[-0.27957395 0.00627436], Reward=-1.0
Step 31: State=[-0.27397063 0.00560332], Reward=-1.0
Step 32: State=[-0.26906936 0.00490127], Reward=-1.0
Step 33: State=[-0.26489689 0.00417247], Reward=-1.0
Step 34: State=[-0.26147568 0.00342121], Reward=-1.0
Step 35: State=[-0.25882396 0.00265172], Reward=-1.0
Step 36: State=[-0.25695571 0.00186825], Reward=-1.0
Step 37: State=[-0.25588073 0.00107498], Reward=-1.0
Step 38: State=[-0.25560462 0.00027611], Reward=-1.0
Step 39: State=[-0.25612883 -0.00052421], Reward=-1.0
Step 40: State=[-0.25745062 -0.00132179], Reward=-1.0
Step 41: State=[-0.25956309 -0.00211247], Reward=-1.0
Step 42: State=[-0.26245514 -0.00289205], Reward=-1.0
Step 43: State=[-0.26611148 -0.00365634], Reward=-1.0
Step 44: State=[-0.27051257 -0.00440109], Reward=-1.0
Step 45: State=[-0.27563463 -0.00512205], Reward=-1.0
Step 46: State=[-0.28144957 -0.00581494], Reward=-1.0
Step 47: State=[-0.28792506 -0.00647549], Reward=-1.0
Step 48: State=[-0.29502448 -0.00709942], Reward=-1.0
Step 49: State=[-0.30270698 -0.0076825], Reward=-1.0
Step 50: State=[-0.31092755 -0.00822057], Reward=-1.0
Step 51: State=[-0.31963713 -0.00870957], Reward=-1.0
Step 52: State=[-0.32878273 -0.0091456], Reward=-1.0
Step 53: State=[-0.33830768 -0.00952495], Reward=-1.0
Step 54: State=[-0.34815185 -0.00984416], Reward=-1.0
Step 55: State=[-0.35825194 -0.0101001], Reward=-1.0
Step 56: State=[-0.36854191 -0.01028996], Reward=-1.0

```
Step 57: State=[-0.37895331 -0.0104114 ], Reward=-1.0
Step 58: State=[-0.38941582 -0.01046252], Reward=-1.0
Step 59: State=[-0.39985775 -0.01044193], Reward=-1.0
Step 60: State=[-0.41020657 -0.01034882], Reward=-1.0
Step 61: State=[-0.42038952 -0.01018295], Reward=-1.0
Step 62: State=[-0.43033423 -0.00994471], Reward=-1.0
Step 63: State=[-0.43996933 -0.0096351 ], Reward=-1.0
Step 64: State=[-0.4492251 -0.00925577], Reward=-1.0
Step 65: State=[-0.45803405 -0.00880895], Reward=-1.0
Step 66: State=[-0.46633157 -0.00829752], Reward=-1.0
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Step 82: State=[-0.49520411 0.00460632], Reward=-1.0
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Step 88: State=[-0.45262646 0.00862217], Reward=-1.0
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Step 90: State=[-0.43403342 0.00949915], Reward=-1.0
Step 91: State=[-0.42419795 0.00983547], Reward=-1.0
Step 92: State=[-0.41409699 0.01010096], Reward=-1.0
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Step 94: State=[-0.39338746 0.01041514], Reward=-1.0
Step 95: State=[-0.38292426 0.0104632 ], Reward=-1.0
Step 96: State=[-0.37248508 0.01043918], Reward=-1.0
Step 97: State=[-0.36214083 0.01034425], Reward=-1.0
Step 98: State=[-0.35196071 0.01018012], Reward=-1.0
Step 99: State=[-0.34201175 0.00994897], Reward=-1.0
Step 100: State=[-0.33235831 0.00965343], Reward=-1.0
Step 101: State=[-0.32306179 0.00929653], Reward=-1.0
Step 102: State=[-0.31418019 0.0088816 ], Reward=-1.0
Step 103: State=[-0.30576792 0.00841226], Reward=-1.0
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Step 112: State=[-0.25816021 0.00241005], Reward=-1.0
```

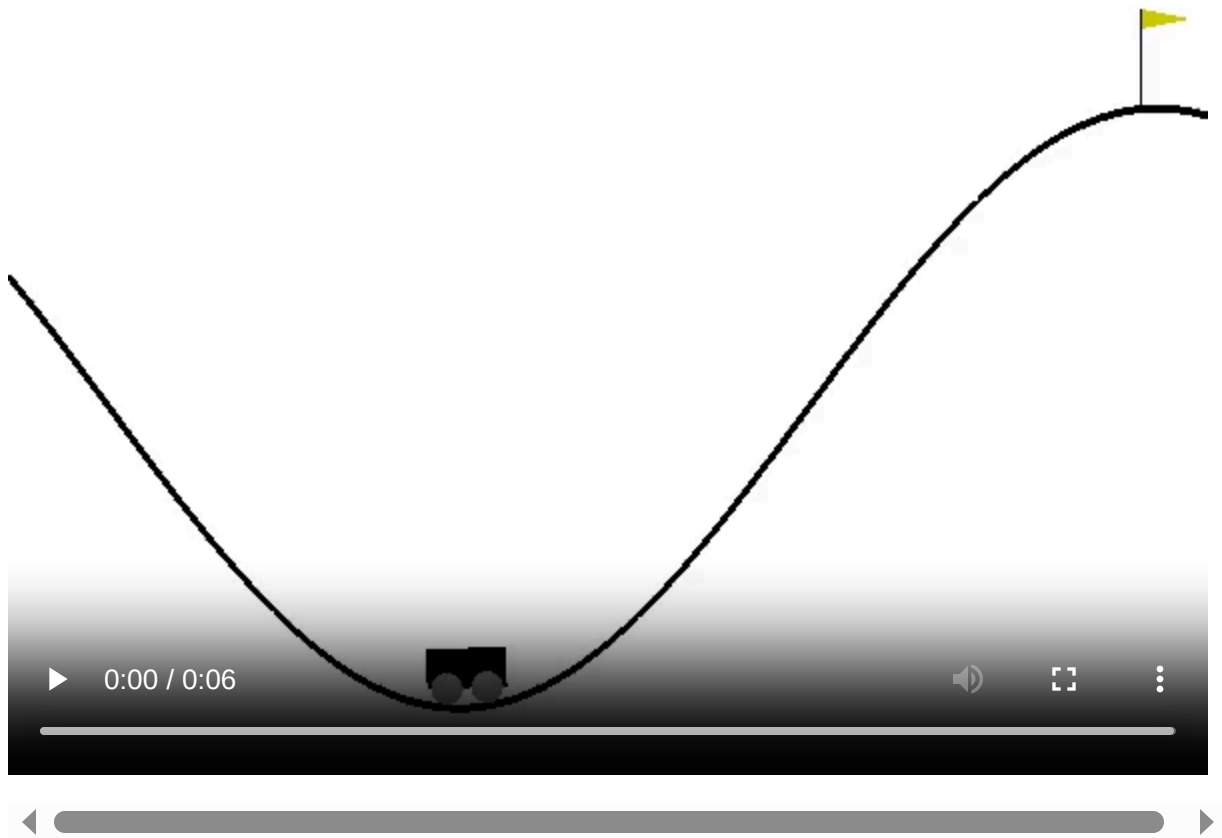


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Step 115: State=[-2.55681628e-01  2.78670044e-05], Reward=-1.0
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Step 164: State=[-0.45862902  0.0082596 ], Reward=-1.0
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Step 167: State=[-0.43101588  0.00961093], Reward=-1.0
Step 168: State=[-0.42109043  0.00992545], Reward=-1.0
```

```
Step 169: State=[-0.41092173  0.0101687 ], Reward=-1.0
Step 170: State=[-0.4005821  0.01033962], Reward=-1.0
Step 171: State=[-0.3901443  0.0104378], Reward=-1.0
Step 172: State=[-0.37968088  0.01046342], Reward=-1.0
Step 173: State=[-0.36926363  0.01041726], Reward=-1.0
Step 174: State=[-0.35896297  0.01030066], Reward=-1.0
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Step 176: State=[-0.33898342  0.00986407], Reward=-1.0
Step 177: State=[-0.32943426  0.00954916], Reward=-1.0
Step 178: State=[-0.32026037  0.00917389], Reward=-1.0
Step 179: State=[-0.31151868  0.00874169], Reward=-1.0
Step 180: State=[-0.30326242  0.00825625], Reward=-1.0
Step 181: State=[-0.29554096  0.00772147], Reward=-1.0
Step 182: State=[-0.28839957  0.00714139], Reward=-1.0
Step 183: State=[-0.28187941  0.00652016], Reward=-1.0
Step 184: State=[-0.27601738  0.00586203], Reward=-1.0
Step 185: State=[-0.27084613  0.00517125], Reward=-1.0
Step 186: State=[-0.26639402  0.00445211], Reward=-1.0
Step 187: State=[-0.26268515  0.00370887], Reward=-1.0
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Step 189: State=[-0.25757219  0.00216715], Reward=-1.0
Step 190: State=[-0.25619508  0.00137711], Reward=-1.0
Step 191: State=[-0.25561521  0.00057987], Reward=-1.0
Step 192: State=[-2.55835595e-01 -2.20385847e-04], Reward=-1.0
Step 193: State=[-0.25685509 -0.0010195 ], Reward=-1.0
Step 194: State=[-0.25866838 -0.00181329], Reward=-1.0
Step 195: State=[-0.26126596 -0.00259758], Reward=-1.0
Step 196: State=[-0.26463414 -0.00336818], Reward=-1.0
Step 197: State=[-0.26875498 -0.00412085], Reward=-1.0
Step 198: State=[-0.27360632 -0.00485134], Reward=-1.0
Step 199: State=[-0.27916172 -0.0055554 ], Reward=-1.0
Step 200: State=[-0.28539045 -0.00622873], Reward=-1.0
```

It helps to visualize the car. The following code shows a video of the car when run from a notebook.

```
In [6]: # HIDE OUTPUT
show_video()
```



Programmed Car

Now we will look at a car that I hand-programmed. This car is straightforward; however, it solves the problem. The programmed car always applies force in one direction or another. It does not break. Whatever direction the vehicle is currently rolling, the agent uses power in that direction. Therefore, the car begins to climb a hill, is overpowered, and turns backward. However, once it starts to roll backward, force is immediately applied in this new direction.

The following code implements this preprogrammed car.

```
In [7]: import gym

if COLAB:
    env = wrap_env(gym.make("MountainCar-v0"))
else:
    env = gym.make("MountainCar-v0")

state = env.reset()
done = False

i = 0
while not done:
    i += 1

    if state[1] > 0:
```

```
        action = 2
    else:
        action = 0

    state, reward, done, _ = env.step(action)
    env.render()
    print(f"Step {i}: State={state}, Reward={reward}")

env.close()
```

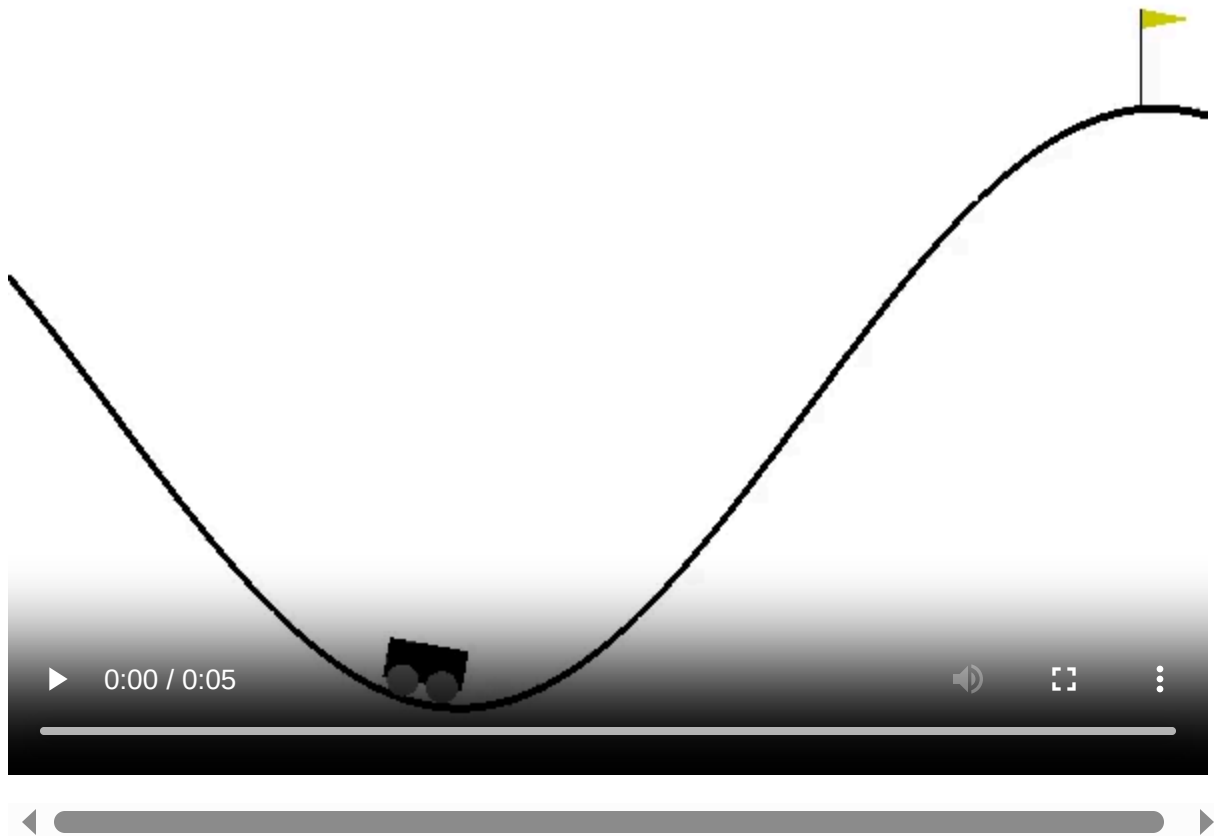
Step 1: State=[-5.84581471e-01 -5.49227966e-04], Reward=-1.0
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Step 3: State=[-0.58730739 -0.00163151], Reward=-1.0
Step 4: State=[-0.58946399 -0.0021566], Reward=-1.0
Step 5: State=[-0.59212981 -0.00266582], Reward=-1.0
Step 6: State=[-0.59528526 -0.00315545], Reward=-1.0
Step 7: State=[-0.5989072 -0.00362194], Reward=-1.0
Step 8: State=[-0.60296912 -0.00406192], Reward=-1.0
Step 9: State=[-0.60744137 -0.00447225], Reward=-1.0
Step 10: State=[-0.61229141 -0.00485004], Reward=-1.0
Step 11: State=[-0.61748407 -0.00519267], Reward=-1.0
Step 12: State=[-0.62298187 -0.0054978], Reward=-1.0
Step 13: State=[-0.62874529 -0.00576342], Reward=-1.0
Step 14: State=[-0.63473313 -0.00598783], Reward=-1.0
Step 15: State=[-0.64090281 -0.00616968], Reward=-1.0
Step 16: State=[-0.64721076 -0.00630795], Reward=-1.0
Step 17: State=[-0.65361272 -0.00640196], Reward=-1.0
Step 18: State=[-0.66006412 -0.00645139], Reward=-1.0
Step 19: State=[-0.66652037 -0.00645626], Reward=-1.0
Step 20: State=[-0.67293726 -0.00641689], Reward=-1.0
Step 21: State=[-0.6792712 -0.00633394], Reward=-1.0
Step 22: State=[-0.68547958 -0.00620838], Reward=-1.0
Step 23: State=[-0.69152102 -0.00604144], Reward=-1.0
Step 24: State=[-0.69735564 -0.00583462], Reward=-1.0
Step 25: State=[-0.7029453 -0.00558966], Reward=-1.0
Step 26: State=[-0.70825383 -0.00530853], Reward=-1.0
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Step 30: State=[-0.72603185 -0.00386771], Reward=-1.0
Step 31: State=[-0.72947294 -0.00344108], Reward=-1.0
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Step 33: State=[-0.73499362 -0.00252735], Reward=-1.0
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Step 37: State=[-7.40181738e-01 -5.40214614e-04], Reward=-1.0
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Step 48: State=[-0.62787487 0.02109773], Reward=-1.0
Step 49: State=[-0.60500776 0.02286711], Reward=-1.0
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```
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Step 60: State=[-0.29131919  0.02942639], Reward=-1.0
Step 61: State=[-0.26249729  0.02882189], Reward=-1.0
Step 62: State=[-0.23443946  0.02805783], Reward=-1.0
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Step 78: State=[0.04112878  0.00629344], Reward=-1.0
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Step 80: State=[0.04927738  0.00333615], Reward=-1.0
Step 81: State=[0.05114081  0.00186342], Reward=-1.0
Step 82: State=[0.05153359  0.00039279], Reward=-1.0
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Step 88: State=[-0.00712768 -0.01849973], Reward=-1.0
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Step 102: State=[-0.59271773 -0.05607493], Reward=-1.0
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Step 111: State=[-1.07872672 -0.0493206 ], Reward=-1.0
Step 112: State=[-1.1265585  -0.04783178], Reward=-1.0
```

```
Step 113: State=[-1.1729608 -0.0464023], Reward=-1.0
Step 114: State=[-1.2 0. ], Reward=-1.0
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Step 136: State=[-0.42483166 0.06212684], Reward=-1.0
Step 137: State=[-0.36243478 0.06239688], Reward=-1.0
Step 138: State=[-0.30020009 0.06223469], Reward=-1.0
Step 139: State=[-0.23851824 0.06168185], Reward=-1.0
Step 140: State=[-0.17772322 0.06079502], Reward=-1.0
Step 141: State=[-0.1180812 0.05964202], Reward=-1.0
Step 142: State=[-0.05978395 0.05829725], Reward=-1.0
Step 143: State=[-0.0029466 0.05683735], Reward=-1.0
Step 144: State=[0.05239085 0.05533745], Reward=-1.0
Step 145: State=[0.10625911 0.05386826], Reward=-1.0
Step 146: State=[0.15875332 0.05249421], Reward=-1.0
Step 147: State=[0.21002575 0.05127242], Reward=-1.0
Step 148: State=[0.26027822 0.05025247], Reward=-1.0
Step 149: State=[0.30975487 0.04947665], Reward=-1.0
Step 150: State=[0.35873547 0.0489806 ], Reward=-1.0
Step 151: State=[0.40752939 0.04879392], Reward=-1.0
Step 152: State=[0.45647027 0.04894088], Reward=-1.0
Step 153: State=[0.50591109 0.04944082], Reward=-1.0
```

We now visualize the preprogrammed car solving the problem.

```
In [8]: # HIDE OUTPUT
show_video()
```



Reinforcement Learning

Q-Learning is a system of rewards that the algorithm gives an agent for successfully moving the environment into a state considered successful. These rewards are the Q-values from which this algorithm takes its name. The final output from the Q-Learning algorithm is a table of Q-values that indicate the reward value of every action that the agent can take, given every possible environment state. The agent must bin continuous state values into a fixed finite number of columns.

Learning occurs when the algorithm runs the agent and environment through episodes and updates the Q-values based on the rewards received from actions taken; Figure 12.REINF provides a high-level overview of this reinforcement or Q-Learning loop.

Figure 12.REINF:Reinforcement/Q Learning



The Q-values can dictate action by selecting the action column with the highest Q-value for the current environment state. The choice between choosing a random action and a Q-value-driven action is governed by the epsilon (ϵ) parameter, the probability of random action.

Each time through the training loop, the training algorithm updates the Q-values according to the following equation.

$$Q^{new}(s_t, a_t) \leftarrow \underbrace{Q(s_t, a_t)}_{\text{old value}} + \underbrace{\alpha}_{\text{learning rate}} \cdot \underbrace{\left(\underbrace{r_t}_{\text{reward}} + \underbrace{\gamma}_{\text{discount factor}} \cdot \underbrace{\max_a Q(s_{t+1}, a)}_{\text{estimate of optimal future value}} \right)}_{\text{new value (temporal difference target)}}$$

temporal difference

There are several parameters in this equation:

- alpha (α) - The learning rate, how much should the current step cause the Q-values to be updated.
- lambda (λ) - The discount factor is the percentage of future reward that the algorithm should consider in this update.

This equation modifies several values:

- $Q(s_t, a_t)$ - The Q-table. For each combination of states, what reward would the agent likely receive for performing each action?
- s_t - The current state.
- r_t - The last reward received.
- a_t - The action that the agent will perform.

The equation works by calculating a delta (temporal difference) that the equation should apply to the old state. This learning rate (α) scales this delta. A learning rate of 1.0 would fully implement the temporal difference in the Q-values each iteration and would likely be very chaotic.

There are two parts to the temporal difference: the new and old values. The new value is subtracted from the old value to provide a delta; the full amount we would change the Q-value by if the learning rate did not scale this value. The new value is a summation of the reward received from the last action and the maximum Q-values from the resulting state when the client takes this action. Adding the maximum of action Q-values for the new state is essential because it estimates the optimal future values from proceeding with this action.

Q-Learning Car

We will now use Q-Learning to produce a car that learns to drive itself. Look out, Tesla!
We begin by defining two essential functions.

```
In [9]: import gym
import numpy as np

# This function converts the floating point state values into
# discrete values. This is often called binning. We divide
# the range that the state values might occupy and assign
# each region to a bucket.
def calc_discrete_state(state):
    discrete_state = (state - env.observation_space.low)/buckets
    return tuple(discrete_state.astype(int))

# Run one game. The q_table to use is provided. We also
# provide a flag to indicate if the game should be
# rendered/animated. Finally, we also provide
# a flag to indicate if the q_table should be updated.
def run_game(q_table, render, should_update):
    done = False
    discrete_state = calc_discrete_state(env.reset())
    success = False

    while not done:
        # Exploit or explore
        if np.random.random() > epsilon:
            # Exploit - use q-table to take current best action
            # (and probably refine)
            action = np.argmax(q_table[discrete_state])
        else:
            # Explore - t
            action = np.random.randint(0, env.action_space.n)

        # Run simulation step
        new_state, reward, done, _ = env.step(action)

        # Convert continuous state to discrete
        new_state_disc = calc_discrete_state(new_state)

        # Have we reached the goal position (have we won?)?
        if new_state[0] >= env.unwrapped.goal_position:
            success = True

        # Update q-table
        if should_update:
            max_future_q = np.max(q_table[new_state_disc])
            current_q = q_table[discrete_state + (action,)]
            new_q = (1 - LEARNING_RATE) * current_q + LEARNING_RATE * \
                (reward + DISCOUNT * max_future_q)
            q_table[discrete_state + (action,)] = new_q

        discrete_state = new_state_disc

    if render:
```

```
env.render()

return success
```

Several hyperparameters are very important for Q-Learning. These parameters will likely need adjustment as you apply Q-Learning to other problems. Because of this, it is crucial to understand the role of each parameter.

- **LEARNING_RATE** The rate at which previous Q-values are updated based on new episodes run during training.
- **DISCOUNT** The amount of significance to give estimates of future rewards when added to the reward for the current action taken. A value of 0.95 would indicate a discount of 5% on the future reward estimates.
- **EPISODES** The number of episodes to train over. Increase this for more complex problems; however, training time also increases.
- **SHOW EVERY** How many episodes to allow to elapse before showing an update.
- **DISCRETE_GRID_SIZE** How many buckets to use when converting each continuous state variable. For example, [10, 10] indicates that the algorithm should use ten buckets for the first and second state variables.
- **START_EPSILON_DECAYING** Epsilon is the probability that the agent will select a random action over what the Q-Table suggests. This value determines the starting probability of randomness.
- **END_EPSILON_DECAYING** How many episodes should elapse before epsilon goes to zero and no random actions are permitted. For example, EPISODES//10 means only the first 1/10th of the episodes might have random actions.

```
In [10]: LEARNING_RATE = 0.1
DISCOUNT = 0.95
EPISODES = 50000
SHOW EVERY = 1000

DISCRETE_GRID_SIZE = [10, 10]
START_EPSILON_DECAYING = 0.5
END_EPSILON_DECAYING = EPISODES//10
```

We can now make the environment. If we are running in Google COLAB, we wrap the environment to be displayed inside the web browser. Next, create the discrete buckets for state and build Q-table.

```
In [11]: if COLAB:
env = wrap_env(gym.make("MountainCar-v0"))
else:
env = gym.make("MountainCar-v0")

epsilon = 1
epsilon_change = epsilon/(END_EPSILON_DECAYING - START_EPSILON_DECAYING)
buckets = (env.observation_space.high - env.observation_space.low) \
/ DISCRETE_GRID_SIZE
```

```
q_table = np.random.uniform(low=-3, high=0, size=(DISCRETE_GRID_SIZE
                                                + [env.action_space.n]))
success = False
```

We can now make the environment. If we are running in Google COLAB, we wrap the environment to be displayed inside the web browser. Next, create the discrete buckets for state and build Q-table.

```
In [12]: episode = 0
success_count = 0

# Loop through the required number of episodes
while episode < EPISODES:
    episode += 1
    done = False

    # Run the game. If we are local, display render animation
    # at SHOW_EVERY intervals.
    if episode % SHOW_EVERY == 0:
        print(f"Current episode: {episode}, success: {success_count}" +
              f" {(float(success_count)/SHOW_EVERY)}")
        success = run_game(q_table, True, False)
        success_count = 0
    else:
        success = run_game(q_table, False, True)

    # Count successes
    if success:
        success_count += 1

    # Move epsilon towards its ending value, if it still needs to move
    if END_EPSILON_DECAYING >= episode >= START_EPSILON_DECAYING:
        epsilon = max(0, epsilon - epsilon_change)

print(success)
```

```
Current episode: 1000, success: 0 0.0
Current episode: 2000, success: 0 0.0
Current episode: 3000, success: 0 0.0
Current episode: 4000, success: 31 0.031
Current episode: 5000, success: 321 0.321
Current episode: 6000, success: 602 0.602
Current episode: 7000, success: 620 0.62
Current episode: 8000, success: 821 0.821
Current episode: 9000, success: 707 0.707
Current episode: 10000, success: 714 0.714
Current episode: 11000, success: 574 0.574
Current episode: 12000, success: 443 0.443
Current episode: 13000, success: 480 0.48
Current episode: 14000, success: 458 0.458
Current episode: 15000, success: 327 0.327
Current episode: 16000, success: 323 0.323
Current episode: 17000, success: 295 0.295
Current episode: 18000, success: 314 0.314
Current episode: 19000, success: 362 0.362
Current episode: 20000, success: 488 0.488
Current episode: 21000, success: 566 0.566
Current episode: 22000, success: 591 0.591
Current episode: 23000, success: 441 0.441
Current episode: 24000, success: 385 0.385
Current episode: 25000, success: 1000 1.0
Current episode: 26000, success: 1000 1.0
Current episode: 27000, success: 993 0.993
Current episode: 28000, success: 67 0.067
Current episode: 29000, success: 0 0.0
Current episode: 30000, success: 39 0.039
Current episode: 31000, success: 204 0.204
Current episode: 32000, success: 429 0.429
Current episode: 33000, success: 345 0.345
Current episode: 34000, success: 970 0.97
Current episode: 35000, success: 583 0.583
Current episode: 36000, success: 752 0.752
Current episode: 37000, success: 955 0.955
Current episode: 38000, success: 997 0.997
Current episode: 39000, success: 1000 1.0
Current episode: 40000, success: 1000 1.0
Current episode: 41000, success: 1000 1.0
Current episode: 42000, success: 1000 1.0
Current episode: 43000, success: 1000 1.0
Current episode: 44000, success: 1000 1.0
Current episode: 45000, success: 1000 1.0
Current episode: 46000, success: 1000 1.0
Current episode: 47000, success: 1000 1.0
Current episode: 48000, success: 1000 1.0
Current episode: 49000, success: 1000 1.0
Current episode: 50000, success: 1000 1.0
True
```

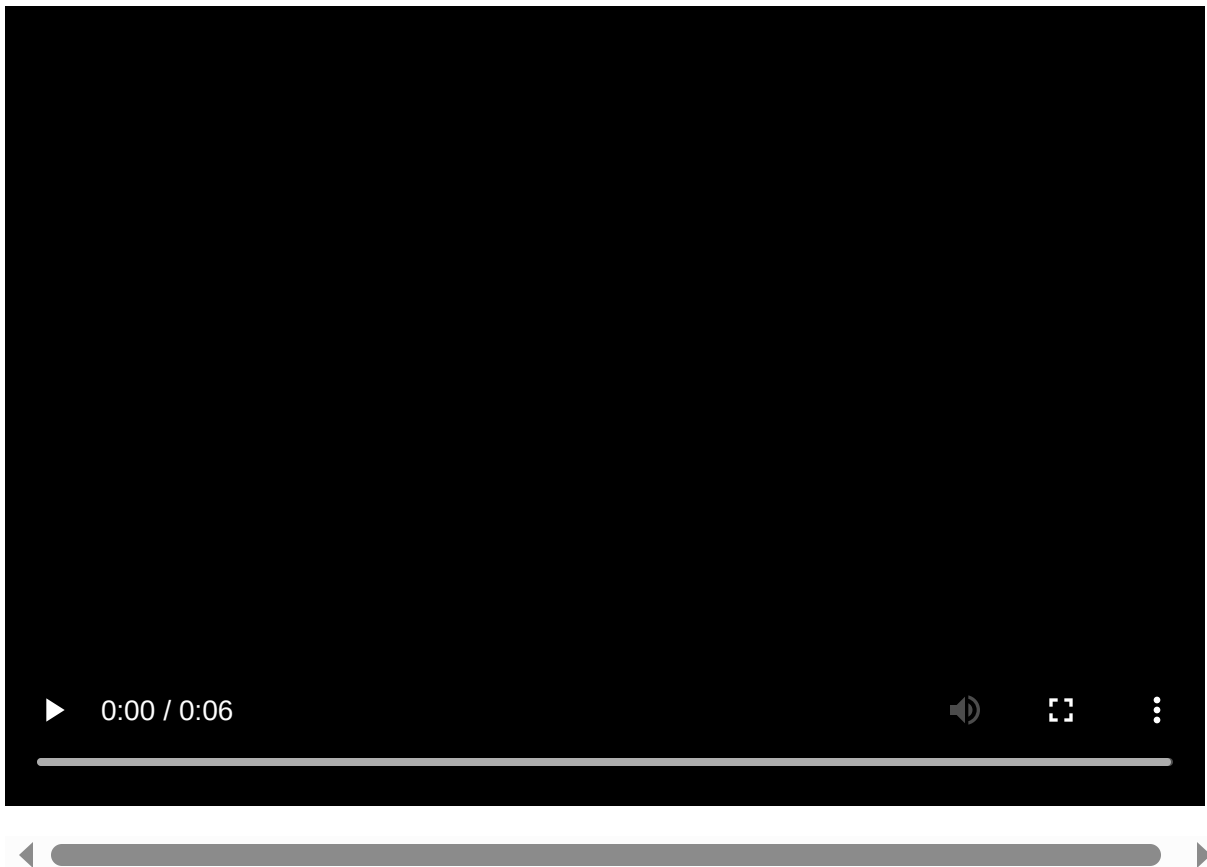
As you can see, the number of successful episodes generally increases as training progresses. It is not advisable to stop the first time we observe 100% success over 1,000 episodes. There is a randomness to most games, so it is not likely that an agent

would retain its 100% success rate with a new run. It might be safe to stop training once you observe that the agent has gotten 100% for several update intervals.

Running and Observing the Agent

Now that the algorithm has trained the agent, we can observe the agent in action. You can use the following code to see the agent in action.

```
In [13]: # HIDE OUTPUT  
  
run_game(q_table, True, False)  
show_video()
```



Inspecting the Q-Table

We can also display the Q-table. The following code shows the agent's action for each environment state. As the weights of a neural network, this table is not straightforward to interpret. Some patterns do emerge in that direction, as seen by calculating the means of rows and columns. The actions seem consistent at both velocity and position's upper and lower halves.

```
In [14]: import pandas as pd  
  
df = pd.DataFrame(q_table.argmax(axis=2))
```

```
df.columns = [f'v-{x}' for x in range(DISCRETE_GRID_SIZE[0])]
df.index = [f'p-{x}' for x in range(DISCRETE_GRID_SIZE[1])]
df
```

Out[14]:

	v-0	v-1	v-2	v-3	v-4	v-5	v-6	v-7	v-8	v-9
p-0	2	2	2	2	2	2	2	0	2	0
p-1	0	1	0	1	2	2	2	2	2	1
p-2	1	0	0	2	2	2	2	1	1	0
p-3	2	0	0	0	2	2	2	1	2	2
p-4	2	0	0	0	0	2	0	2	2	2
p-5	1	1	2	1	1	0	1	1	2	2
p-6	2	2	0	0	0	0	2	2	2	2
p-7	0	2	1	0	0	1	2	2	2	2
p-8	2	0	1	2	0	0	2	2	1	2
p-9	2	2	2	1	1	0	2	2	2	1

In [15]: `df.mean(axis=0)`

Out[15]:

v-0	1.4
v-1	1.0
v-2	0.8
v-3	0.9
v-4	1.0
v-5	1.1
v-6	1.7
v-7	1.5
v-8	1.8
v-9	1.4

dtype: float64

In [16]: `df.mean(axis=1)`

Out[16]:

p-0	1.6
p-1	1.3
p-2	1.1
p-3	1.3
p-4	1.0
p-5	1.2
p-6	1.2
p-7	1.2
p-8	1.2
p-9	1.5

dtype: float64



T81-558: Applications of Deep Neural Networks

Module 12: Reinforcement Learning

- Instructor: [Jeff Heaton](#), McKelvey School of Engineering, [Washington University in St. Louis](#)
- For more information visit the [class website](#).

Module 12 Video Material

- Part 12.1: Introduction to the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
- Part 12.2: Introduction to Q-Learning [\[Video\]](#) [\[Notebook\]](#)
- **Part 12.3: Keras Q-Learning in the OpenAI Gym** [\[Video\]](#) [\[Notebook\]](#)
- Part 12.4: Atari Games with Keras Neural Networks [\[Video\]](#) [\[Notebook\]](#)
- Part 12.5: Application of Reinforcement Learning [\[Video\]](#) [\[Notebook\]](#)

Google CoLab Instructions

The following code ensures that Google CoLab is running the correct version of TensorFlow.

```
In [1]: try:
        from google.colab import drive
        %tensorflow_version 2.x
        COLAB = True
        print("Note: using Google CoLab")
    except:
        print("Note: not using Google CoLab")
        COLAB = False
```

Note: using Google CoLab

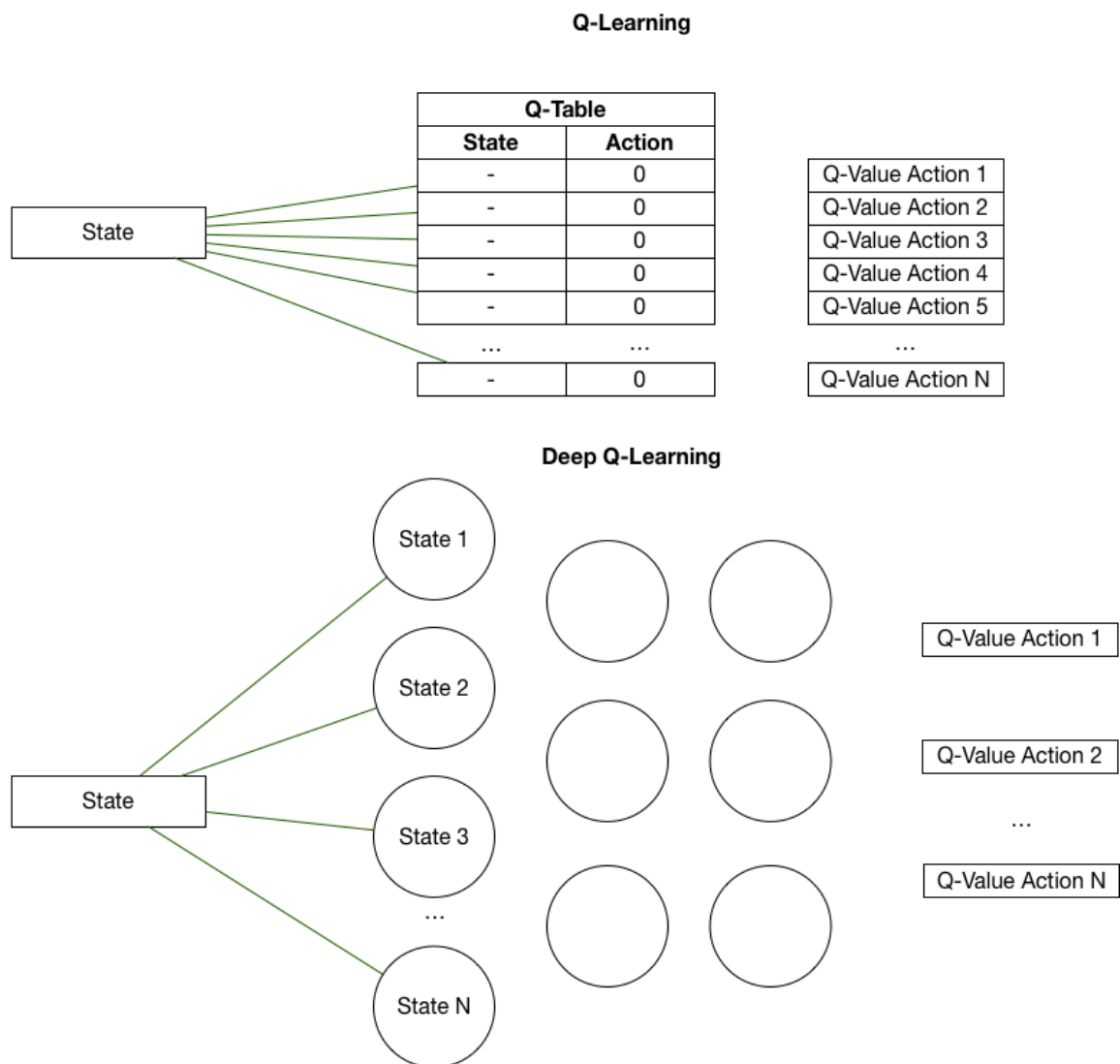
Part 12.3: Keras Q-Learning in the OpenAI Gym

As we covered in the previous part, Q-Learning is a robust machine learning algorithm. Unfortunately, Q-Learning requires that the Q-table contain an entry for every possible

state that the environment can take. Traditional Q-learning might be a good learning algorithm if the environment only includes a handful of discrete state elements. However, the Q-table can become prohibitively large if the state space is large.

Creating policies for large state spaces is a task that Deep Q-Learning Networks (DQN) can usually handle. Neural networks can generalize these states and learn commonalities. Unlike a table, a neural network does not require the program to represent every combination of state and action. A DQN maps the state to its input neurons and the action Q-values to the output neurons. The DQN effectively becomes a function that accepts the state and suggests action by returning the expected reward for each possible action. Figure 12.DQL demonstrates the DQN structure and mapping between state and action.

Figure 12.DQL: Deep Q-Learning (DQL)



As this diagram illustrates, the environment state contains several elements. For the basic DQN, the state can be a mix of continuous and categorical/discrete values. For the DQN, the discrete state elements the program typically encoded as dummy variables. The actions should be discrete when your program implements a DQN.

Other algorithms support continuous outputs, which we will discuss later in this chapter.

This chapter will use [TF-Agents](#) to implement a DQN to solve the cart-pole environment. TF-Agents makes designing, implementing, and testing new RL algorithms easier by providing well-tested modular components that can be modified and extended. It enables fast code iteration with functional test integration and benchmarking.

DQN and the Cart-Pole Problem

Barto (1983) first described the cart-pole problem. [\[Cite:barto1983neuronlike\]](#) A cart is connected to a rigid hinged pole. The cart is free to move only in the vertical plane of the cart/track. The agent can apply an impulsive "left" or "right" force F of a fixed magnitude to the cart at discrete time intervals. The cart-pole environment simulates the physics behind keeping the pole reasonably upright position on the cart. The environment has four state variables:

- x The position of the cart on the track.
- θ The angle of the pole with the vertical
- \dot{x} The cart velocity.
- $\dot{\theta}$ The rate of change of the angle.

The action space consists of discrete actions:

- Apply force left
- Apply force right

To apply DQN to this problem, you need to create the following components for TF-Agents.

- Environment
- Agent
- Policies
- Metrics and Evaluation
- Replay Buffer
- Data Collection
- Training

These components are standard in most DQN implementations. Later, we will apply these same components to an Atari game, and after that, a problem with our design. This example is based on the [cart-pole tutorial](#) provided for TF-Agents.

First, we must install TF-Agents.

```
In [2]: # HIDE OUTPUT
if COLAB:
    !sudo apt-get install -y xvfb ffmpeg x11-utils
    !pip install -q 'gym==0.10.11'
    !pip install -q 'imageio==2.4.0'
    !pip install -q PILLOW
    !pip install -q 'pyglet==1.3.2'
    !pip install -q pyvirtualdisplay
    !pip install -q tf-agents
    !pip install -q pygame
```

```

Reading package lists... Done
Building dependency tree
Reading state information... Done
ffmpeg is already the newest version (7:3.4.8-0ubuntu0.2).
Suggested packages:
  mesa-utils
The following NEW packages will be installed:
  libxxf86dga1 x11-utils xvfb
0 upgraded, 3 newly installed, 0 to remove and 39 not upgraded.
Need to get 993 kB of archives.
After this operation, 2,982 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu bionic/main amd64 libxxf86dga1 amd64
2:1.1.4-1 [13.7 kB]
Get:2 http://archive.ubuntu.com/ubuntu bionic/main amd64 x11-utils amd64 7.7
+3build1 [196 kB]
Get:3 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 xvfb am
d64 2:1.19.6-1ubuntu4.10 [784 kB]
Fetched 993 kB in 0s (7,377 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based fr
ontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 7
6, <=> line 3.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package libxxf86dga1:amd64.
(Reading database ... 156210 files and directories currently installed.)
Preparing to unpack .../libxxf86dga1_2%3a1.1.4-1_amd64.deb ...
Unpacking libxxf86dga1:amd64 (2:1.1.4-1) ...
Selecting previously unselected package x11-utils.
Preparing to unpack .../x11-utils_7.7+3build1_amd64.deb ...
Unpacking x11-utils (7.7+3build1) ...
Selecting previously unselected package xvfb.
Preparing to unpack .../xvfb_2%3a1.19.6-1ubuntu4.10_amd64.deb ...
Unpacking xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up libxxf86dga1:amd64 (2:1.1.4-1) ...
Setting up x11-utils (7.7+3build1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.3) ...
/sbin/ldconfig.real: /usr/local/lib/python3.7/dist-packages/ideep4py/lib/lib
mkldnn.so.0 is not a symbolic link

```

```

|████████████████████████████████████████| 1.5 MB 16.4 MB/s
Building wheel for gym (setup.py) ... done
|████████████████████████████████████████| 3.3 MB 14.8 MB/s
Building wheel for imageio (setup.py) ... done

```

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

albumations 0.1.12 requires imgaug<0.2.7,>=0.2.5, but you have imgaug 0.2.9 which is incompatible.

```

|████████████████████████████████████████| 1.0 MB 13.3 MB/s
|████████████████████████████████████████| 1.3 MB 15.5 MB/s

```

```

|██████████| 626 kB 58.9 MB/s
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing wheel metadata ... done
Building wheel for gym (PEP 517) ... done
|██████████| 21.8 MB 1.2 MB/s

```

We begin by importing needed Python libraries.

```

In [3]: import base64
import imageio
import IPython
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import PIL.Image
import pyvirtualdisplay

import tensorflow as tf

from tf_agents.agents.dqn import dqn_agent
from tf_agents.drivers import dynamic_step_driver
from tf_agents.environments import suite_gym
from tf_agents.environments import tf_py_environment
from tf_agents.eval import metric_utils
from tf_agents.metrics import tf_metrics
from tf_agents.networks import q_network
from tf_agents.policies import random_tf_policy
from tf_agents.replay_buffers import tf_uniform_replay_buffer
from tf_agents.trajectories import trajectory
from tf_agents.utils import common

```

To allow this example to run in a notebook, we use a virtual display that will output an embedded video. If running this code outside a notebook, you could omit the virtual display and animate it directly to a window.

```

In [4]: # Set up a virtual display for rendering OpenAI gym environments.
display = pyvirtualdisplay.Display(visible=0, size=(1400, 900)).start()

```

Hyperparameters

We must define Several hyperparameters for the algorithm to train the agent. The TF-Agent example provided reasonably well-tuned hyperparameters for cart-pole. Later we will adapt these to an Atari game.

```

In [5]: # How long should training run?
num_iterations = 20000
# How many initial random steps, before training start, to
# collect initial data.
initial_collect_steps = 1000
# How many steps should we run each iteration to collect
# data from.

```

```
collect_steps_per_iteration = 1
# How much data should we store for training examples.
replay_buffer_max_length = 100000

batch_size = 64
learning_rate = 1e-3
# How often should the program provide an update.
log_interval = 200

# How many episodes should the program use for each evaluation.
num_eval_episodes = 10
# How often should an evaluation occur.
eval_interval = 1000
```

Environment

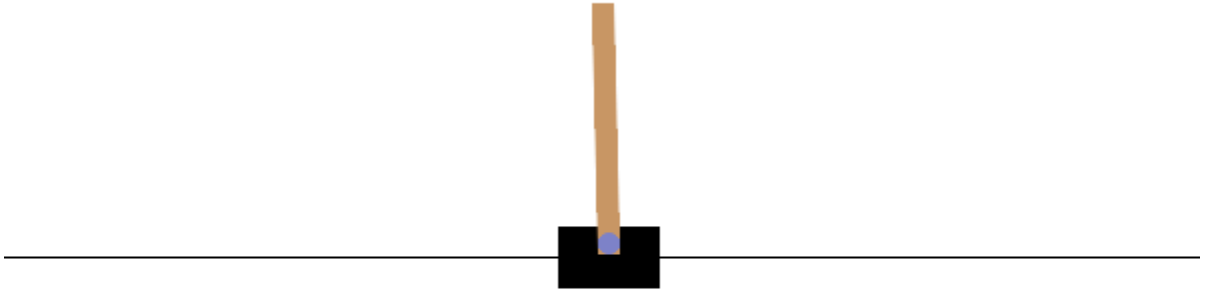
TF-Agents use OpenAI gym environments to represent the task or problem to be solved. Standard environments can be created in TF-Agents using **tf_agents.environments** suites. TF-Agents has suites for loading environments from sources such as the OpenAI Gym, Atari, and DM Control. We begin by loading the CartPole environment from the OpenAI Gym suite.

```
In [6]: env_name = 'CartPole-v0'
env = suite_gym.load(env_name)
```

We will quickly render this environment to see the visual representation.

```
In [7]: env.reset()
PIL.Image.fromarray(env.render())
```

Out[7]:



The `environment.step` method takes an `action` in the environment and returns a `TimeStep` tuple containing the following observation of the environment and the reward for the action.

The `time_step_spec()` method returns the specification for the `TimeStep` tuple. Its `observation` attribute shows the shape of observations, the data types, and the ranges of allowed values. The `reward` attribute shows the same details for the reward.

```
In [8]: print('Observation Spec:')
        print(env.time_step_spec().observation)
```

Observation Spec:

```
BoundedArraySpec(shape=(4,), dtype=dtype('float32'), name='observation', minimum=[-4.8000002e+00 -3.4028235e+38 -4.1887903e-01 -3.4028235e+38], maximum=[4.8000002e+00 3.4028235e+38 4.1887903e-01 3.4028235e+38])
```

```
In [9]: print('Reward Spec:')
        print(env.time_step_spec().reward)
```

Reward Spec:

```
ArraySpec(shape=(), dtype=dtype('float32'), name='reward')
```

The `action_spec()` method returns the shape, data types, and allowed values of valid actions.

```
In [10]: print('Action Spec:')
          print(env.action_spec())
```

Action Spec:

BoundedArraySpec(shape=(), dtype=dtype('int64'), name='action', minimum=0, maximum=1)

In the Cartpole environment:

- **observation** is an array of 4 floats:
 - the position and velocity of the cart
 - the angular position and velocity of the pole
- **reward** is a scalar float value
- **action** is a scalar integer with only two possible values:
 - **0** — "move left"
 - **1** — "move right"

```
In [11]: time_step = env.reset()
print('Time step:')
print(time_step)

action = np.array(1, dtype=np.int32)

next_time_step = env.step(action)
print('Next time step:')
print(next_time_step)
```

Time step:

```
TimeStep(
{'discount': array(1., dtype=float32),
 'observation': array([-0.03279859,  0.03562892, -0.04014493, -0.04911802],
 dtype=float32),
 'reward': array(0., dtype=float32),
 'step_type': array(0, dtype=int32)})
```

Next time step:

```
TimeStep(
{'discount': array(1., dtype=float32),
 'observation': array([-0.03208601,  0.23130283, -0.04112729, -0.35419184],
 dtype=float32),
 'reward': array(1., dtype=float32),
 'step_type': array(1, dtype=int32)})
```

Usually, the program instantiates two environments: one for training and one for evaluation.

```
In [12]: train_py_env = suite_gym.load(env_name)
eval_py_env = suite_gym.load(env_name)
```

The Cartpole environment, like most environments, is written in pure Python and is converted to TF-Agents and TensorFlow using the **TFPyEnvironment** wrapper. The original environment's API uses Numpy arrays. The **TFPyEnvironment** turns these to **Tensors** to make them compatible with Tensorflow agents and policies.


```
In [13]: train_env = tf_py_environment.TFPyEnvironment(train_py_env)
eval_env = tf_py_environment.TFPyEnvironment(eval_py_env)
```

Agent

An Agent represents the algorithm used to solve an RL problem. TF-Agents provides standard implementations of a variety of Agents:

- [DQN](#) (used in this example)
- [REINFORCE](#)
- [DDPG](#)
- [TD3](#)
- [PPO](#)
- [SAC](#).

You can only use the DQN agent in environments with a discrete action space. The DQN uses a QNetwork, a neural network model that learns to predict Q-Values (expected returns) for all actions given a state from the environment.

The following code uses **tf_agents.networks.q_network** to create a QNetwork, passing in the **observation_spec**, **action_spec**, and a tuple describing the number and size of the model's hidden layers.

```
In [14]: fc_layer_params = (100,)

q_net = q_network.QNetwork(
    train_env.observation_spec(),
    train_env.action_spec(),
    fc_layer_params=fc_layer_params)
```

Now we use **tf_agents.agents.dqn.dqn_agent** to instantiate a **DqnAgent**. In addition to the **time_step_spec**, **action_spec** and the QNetwork, the agent constructor also requires an optimizer (in this case, **AdamOptimizer**), a loss function, and an integer step counter.

```
In [15]: optimizer = tf.compat.v1.train.AdamOptimizer(learning_rate=learning_rate)

train_step_counter = tf.Variable(0)

agent = dqn_agent.DqnAgent(
    train_env.time_step_spec(),
    train_env.action_spec(),
    q_network=q_net,
    optimizer=optimizer,
    td_errors_loss_fn=common.element_wise_squared_loss,
    train_step_counter=train_step_counter)

agent.initialize()
```

Policies

A policy defines the way an agent acts in an environment. Typically, reinforcement learning aims to train the underlying model until the policy produces the desired outcome.

In this example:

- The desired outcome is keeping the pole balanced upright over the cart.
- The policy returns an action (left or right) for each `time_step` observation.

Agents contain two policies:

- **agent.policy** - The algorithm uses this main policy for evaluation and deployment.
- **agent.collect_policy** - The algorithm this secondary policy for data collection.

```
In [16]: eval_policy = agent.policy
collect_policy = agent.collect_policy
```

You can create policies independently of agents. For example, use **random_tf_policy** to create a policy that will randomly select an action for each **time_step**. We will use this random policy to create initial collection data to begin training.

```
In [17]: random_policy = random_tf_policy.RandomTFPolicy(train_env.time_step_spec(),
                                                         train_env.action_spec())
```

To get an action from a policy, call the **policy.action** method. The **time_step** contains the observation from the environment. This method returns a **PolicyStep**, which is a named tuple with three components:

- **action** - The action to be taken (in this case, 0 or 1).
- **state** - Used for stateful (that is, RNN-based) policies.
- **info** - Auxiliary data, such as log probabilities of actions.

Next, we create an environment and set up the random policy.

```
In [18]: example_environment = tf_py_environment.TFPyEnvironment(
          suite_gym.load('CartPole-v0'))
          time_step = example_environment.reset()
          random_policy.action(time_step)

Out[18]: PolicyStep(action=<tf.Tensor: shape=(1,), dtype=int64, numpy=array([0])>, s
          tate=(), info=())
```

Metrics and Evaluation

The most common metric used to evaluate a policy is the average return. The return is the sum of rewards obtained while running a policy in an environment for an episode. Several episodes are run, creating an average return. The following function computes the average return, given the policy, environment, and number of episodes. We will use this same evaluation for Atari.

```
In [19]: def compute_avg_return(environment, policy, num_episodes=10):

          total_return = 0.0
          for _ in range(num_episodes):

              time_step = environment.reset()
              episode_return = 0.0

              while not time_step.is_last():
                  action_step = policy.action(time_step)
                  time_step = environment.step(action_step.action)
                  episode_return += time_step.reward
                  total_return += episode_return

          avg_return = total_return / num_episodes
          return avg_return.numpy()[0]

# See also the metrics module for standard implementations
# of different metrics.
# https://github.com/tensorflow/agents/tree/master/tf_agents/metrics
```

Running this computation on the `random_policy` shows a baseline performance in the environment.

```
In [20]: compute_avg_return(eval_env, random_policy, num_eval_episodes)

Out[20]: 15.2
```

Replay Buffer

The replay buffer keeps track of data collected from the environment. This tutorial uses **TFUniformReplayBuffer**. The constructor requires the specs for the data it will be collecting. This value is available from the agent using the **collect_data_spec** method. The batch size and maximum buffer length are also required.

```
In [21]: replay_buffer = tf_uniform_replay_buffer.TFUniformReplayBuffer(
        data_spec=agent.collect_data_spec,
        batch_size=train_env.batch_size,
        max_length=replay_buffer_max_length)
```

For most agents, **collect_data_spec** is a named tuple called **Trajectory**, containing the specs for observations, actions, rewards, and other items.

```
In [22]: agent.collect_data_spec
```

```
Out[22]: Trajectory(
  {'action': BoundedTensorSpec(shape=(), dtype=tf.int64, name='action', minimum=array(0), maximum=array(1)),
   'discount': BoundedTensorSpec(shape=(), dtype=tf.float32, name='discount', minimum=array(0., dtype=float32), maximum=array(1., dtype=float32)),
   'next_step_type': TensorSpec(shape=(), dtype=tf.int32, name='step_type'),
   'observation': BoundedTensorSpec(shape=(4,), dtype=tf.float32, name='observation', minimum=array([-4.8000002e+00, -3.4028235e+38, -4.1887903e-01, -3.4028235e+38],
                                     dtype=float32), maximum=array([4.8000002e+00, 3.4028235e+38, 4.1887903e-01, 3.4028235e+38],
                                     dtype=float32)),
   'policy_info': (),
   'reward': TensorSpec(shape=(), dtype=tf.float32, name='reward'),
   'step_type': TensorSpec(shape=(), dtype=tf.int32, name='step_type')})
```

Data Collection

Now execute the random policy in the environment for a few steps, recording the data in the replay buffer.

```
In [23]: def collect_step(environment, policy, buffer):
        time_step = environment.current_time_step()
        action_step = policy.action(time_step)
        next_time_step = environment.step(action_step.action)
        traj = trajectory.from_transition(time_step, action_step, \
                                         next_time_step)

        # Add trajectory to the replay buffer
        buffer.add_batch(traj)

    def collect_data(env, policy, buffer, steps):
        for _ in range(steps):
            collect_step(env, policy, buffer)
```

```
collect_data(train_env, random_policy, replay_buffer, steps=100)

# This loop is so common in RL, that we provide standard implementations.
# For more details see the drivers module.
# https://www.tensorflow.org/agents/api_docs/python/tf_agents/drivers
```

The replay buffer is now a collection of Trajectories. The agent needs access to the replay buffer. TF-Agents provides this access by creating an iterable **tf.data.Dataset** pipeline, which will feed data to the agent.

Each row of the replay buffer only stores a single observation step. But since the DQN Agent needs both the current and following observation to compute the loss, the dataset pipeline will sample two adjacent rows for each item in the batch (**num_steps=2**).

The program also optimizes this dataset by running parallel calls and prefetching data.

```
In [24]: # Dataset generates trajectories with shape [Bx2x...]
dataset = replay_buffer.as_dataset(
    num_parallel_calls=3,
    sample_batch_size=batch_size,
    num_steps=2).prefetch(3)
```

```
dataset
```

WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/autograph/impl/api.py:377: ReplayBuffer.get_next (from tf_agents.replay_buffers.replay_buffer) is deprecated and will be removed in a future version.

Instructions for updating:

Use `as_dataset(..., single_deterministic_pass=False)` instead.

```
Out[24]: <PrefetchDataset element_spec=(Trajectory(
  {'action': TensorSpec(shape=(64, 2), dtype=tf.int64, name=None),
   'discount': TensorSpec(shape=(64, 2), dtype=tf.float32, name=None),
   'next_step_type': TensorSpec(shape=(64, 2), dtype=tf.int32, name=None),
   'observation': TensorSpec(shape=(64, 2, 4), dtype=tf.float32, name=None),
   'policy_info': (),
   'reward': TensorSpec(shape=(64, 2), dtype=tf.float32, name=None),
   'step_type': TensorSpec(shape=(64, 2), dtype=tf.int32, name=None)}), BufferInfo(ids=TensorSpec(shape=(64, 2), dtype=tf.int64, name=None), probabilities=TensorSpec(shape=(64, 2), dtype=tf.float32, name=None)))>
```

```
In [25]: iterator = iter(dataset)

print(iterator)
```

```
<tensorflow.python.data.ops.iterator_ops.OwnedIterator object at 0x7f05c0006c10>
```

Training the agent

Two things must happen during the training loop:

- Collect data from the environment
- Use that data to train the agent's neural network(s)

This example also periodically evaluates the policy and prints the current score.

The following will take ~5 minutes to run.

```
In [26]: # (Optional) Optimize by wrapping some of the code in a graph
# using TF function.
agent.train = common.function(agent.train)

# Reset the train step
agent.train_step_counter.assign(0)

# Evaluate the agent's policy once before training.
avg_return = compute_avg_return(eval_env, agent.policy,
                                num_eval_episodes)
returns = [avg_return]

for _ in range(num_iterations):

    # Collect a few steps using collect_policy and
    # save to the replay buffer.
    for _ in range(collect_steps_per_iteration):
        collect_step(train_env, agent.collect_policy, replay_buffer)

    # Sample a batch of data from the buffer and update
    # the agent's network.
    experience, unused_info = next(iterator)
    train_loss = agent.train(experience).loss

    step = agent.train_step_counter.numpy()

    if step % log_interval == 0:
        print('step = {0}: loss = {1}'.format(step, train_loss))

    if step % eval_interval == 0:
        avg_return = compute_avg_return(eval_env, agent.policy,
                                        num_eval_episodes)
        print('step = {0}: Average Return = {1}'.format(step, avg_return))
        returns.append(avg_return)
```

WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/util/dispatch.py:1082: calling foldr_v2 (from tensorflow.python.ops.functional_ops) with back_prop=False is deprecated and will be removed in a future version.

Instructions for updating:

back_prop=False is deprecated. Consider using tf.stop_gradient instead.

Instead of:

```
results = tf.foldr(fn, elems, back_prop=False)
```

Use:

```
results = tf.nest.map_structure(tf.stop_gradient, tf.foldr(fn, elems))
```

```
step = 200: loss = 23.158374786376953
step = 400: loss = 7.158817768096924
step = 600: loss = 30.97699737548828
step = 800: loss = 9.831337928771973
step = 1000: loss = 9.664928436279297
step = 1000: Average Return = 13.199999809265137
step = 1200: loss = 10.27550220489502
step = 1400: loss = 17.813919067382812
step = 1600: loss = 8.011082649230957
step = 1800: loss = 28.170230865478516
step = 2000: loss = 28.02679443359375
step = 2000: Average Return = 40.099998474121094
step = 2200: loss = 3.2347989082336426
step = 2400: loss = 55.28818893432617
step = 2600: loss = 18.277198791503906
step = 2800: loss = 4.626098155975342
step = 3000: loss = 14.528213500976562
step = 3000: Average Return = 61.79999923706055
step = 3200: loss = 59.28561782836914
step = 3400: loss = 76.63031005859375
step = 3600: loss = 63.14342498779297
step = 3800: loss = 110.42674255371094
step = 4000: loss = 5.175446510314941
step = 4000: Average Return = 146.0
step = 4200: loss = 5.881635665893555
step = 4400: loss = 7.868609428405762
step = 4600: loss = 6.599028587341309
step = 4800: loss = 69.79821014404297
step = 5000: loss = 219.33493041992188
step = 5000: Average Return = 119.5999984741211
step = 5200: loss = 45.901084899902344
step = 5400: loss = 4.329599380493164
step = 5600: loss = 64.89082336425781
step = 5800: loss = 42.906700134277344
step = 6000: loss = 10.80639362335205
step = 6000: Average Return = 190.1999969482422
step = 6200: loss = 33.47439193725586
step = 6400: loss = 9.312165260314941
step = 6600: loss = 124.09418487548828
step = 6800: loss = 9.645675659179688
step = 7000: loss = 12.178140640258789
step = 7000: Average Return = 184.60000610351562
step = 7200: loss = 9.637611389160156
step = 7400: loss = 7.316198348999023
step = 7600: loss = 139.92269897460938
step = 7800: loss = 7.6530256271362305
```

```
step = 8000: loss = 16.512592315673828
step = 8000: Average Return = 191.3000030517578
step = 8200: loss = 104.84465789794922
step = 8400: loss = 164.78646850585938
step = 8600: loss = 124.94630432128906
step = 8800: loss = 13.862188339233398
step = 9000: loss = 154.0853271484375
step = 9000: Average Return = 200.0
step = 9200: loss = 125.97179412841797
step = 9400: loss = 153.52854919433594
step = 9600: loss = 97.84358215332031
step = 9800: loss = 55.670570373535156
step = 10000: loss = 15.632448196411133
step = 10000: Average Return = 200.0
step = 10200: loss = 8.194206237792969
step = 10400: loss = 13.93640422821045
step = 10600: loss = 11.790799140930176
step = 10800: loss = 444.7298278808594
step = 11000: loss = 378.853271484375
step = 11000: Average Return = 197.0
step = 11200: loss = 13.082895278930664
step = 11400: loss = 268.9317626953125
step = 11600: loss = 123.26766204833984
step = 11800: loss = 81.99503326416016
step = 12000: loss = 94.90630340576172
step = 12000: Average Return = 200.0
step = 12200: loss = 10.287437438964844
step = 12400: loss = 275.0940246582031
step = 12600: loss = 115.75547790527344
step = 12800: loss = 668.2427978515625
step = 13000: loss = 798.7186279296875
step = 13000: Average Return = 196.60000610351562
step = 13200: loss = 21.640256881713867
step = 13400: loss = 313.7167663574219
step = 13600: loss = 17.465240478515625
step = 13800: loss = 715.4552001953125
step = 14000: loss = 13.271897315979004
step = 14000: Average Return = 197.89999389648438
step = 14200: loss = 20.86071014404297
step = 14400: loss = 86.7576904296875
step = 14600: loss = 529.219970703125
step = 14800: loss = 969.0336303710938
step = 15000: loss = 298.5212707519531
step = 15000: Average Return = 198.5
step = 15200: loss = 372.925537109375
step = 15400: loss = 214.28077697753906
step = 15600: loss = 11.535277366638184
step = 15800: loss = 40.361358642578125
step = 16000: loss = 19.93735122680664
step = 16000: Average Return = 199.39999389648438
step = 16200: loss = 32.60084533691406
step = 16400: loss = 18.340595245361328
step = 16600: loss = 16.289039611816406
step = 16800: loss = 189.3881378173828
step = 17000: loss = 39.77809143066406
step = 17000: Average Return = 200.0
```



```

step = 17200: loss = 74.69547271728516
step = 17400: loss = 83.34622192382812
step = 17600: loss = 167.67913818359375
step = 17800: loss = 1286.816650390625
step = 18000: loss = 4.552798271179199
step = 18000: Average Return = 200.0
step = 18200: loss = 1149.6190185546875
step = 18400: loss = 39.40950012207031
step = 18600: loss = 785.230712890625
step = 18800: loss = 20.107412338256836
step = 19000: loss = 483.009765625
step = 19000: Average Return = 200.0
step = 19200: loss = 5.911262512207031
step = 19400: loss = 16.59900665283203
step = 19600: loss = 16.253849029541016
step = 19800: loss = 124.63180541992188
step = 20000: loss = 22.45917320251465
step = 20000: Average Return = 198.3000030517578

```

Visualization and Plots

Use **matplotlib.pyplot** to chart how the policy improved during training.

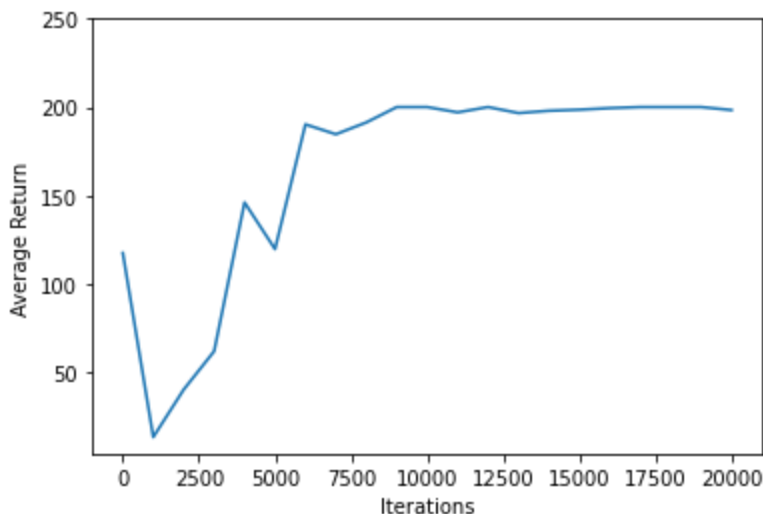
One iteration of **Cartpole-v0** consists of 200 time steps. The environment rewards **+1** for each step the pole stays up, so the maximum return for one episode is 200. The charts show the return increasing towards that maximum each time the algorithm evaluates it during training. (It may be a little unstable and not increase each time monotonically.)

```

In [27]: iterations = range(0, num_iterations + 1, eval_interval)
plt.plot(iterations, returns)
plt.ylabel('Average Return')
plt.xlabel('Iterations')
plt.ylim(top=250)

```

```
Out[27]: (3.859999799728394, 250.0)
```



Videos

The charts are nice. But more exciting is seeing an agent performing a task in an environment.

First, create a function to embed videos in the notebook.

```
In [28]: def embed_mp4(filename):
    """Embeds an mp4 file in the notebook."""
    video = open(filename, 'rb').read()
    b64 = base64.b64encode(video)
    tag = '''
    <video width="640" height="480" controls>
      <source src="data:video/mp4;base64,{0}" type="video/mp4">
      Your browser does not support the video tag.
    </video>'''
    return IPython.display.HTML(tag)
```

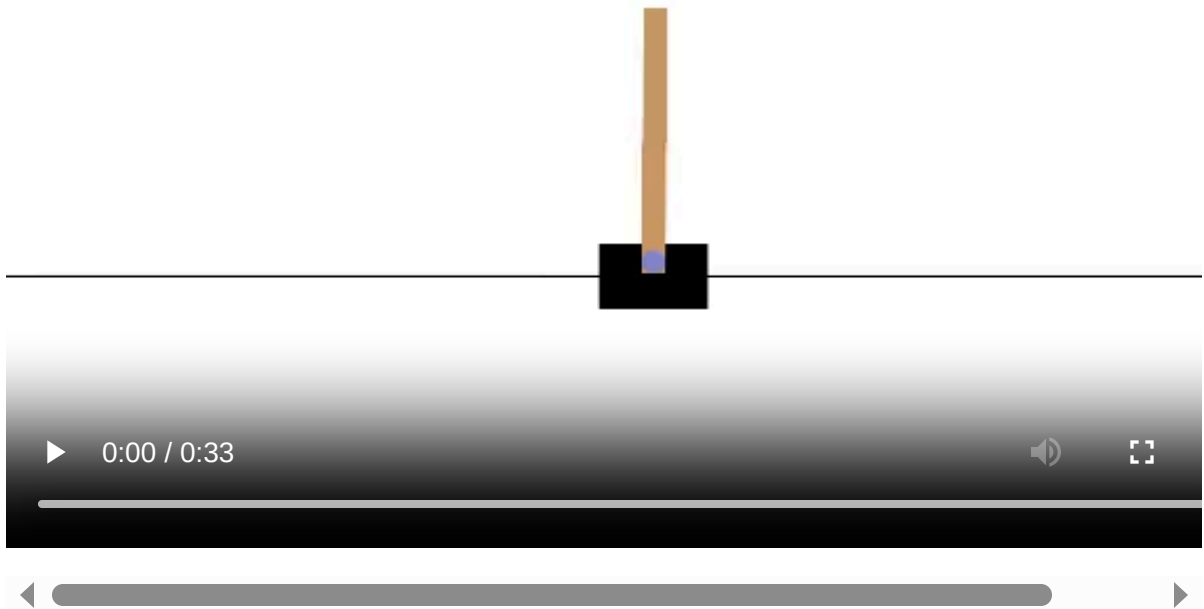
Now iterate through a few episodes of the Cartpole game with the agent. The underlying Python environment (the one "inside" the TensorFlow environment wrapper) provides a `render()` method, which outputs an image of the environment state. We can collect these frames into a video.

```
In [29]: # HIDE OUTPUT
def create_policy_eval_video(policy, filename, num_episodes=5, fps=30):
    filename = filename + ".mp4"
    with imageio.get_writer(filename, fps=fps) as video:
        for _ in range(num_episodes):
            time_step = eval_env.reset()
            video.append_data(eval_py_env.render())
            while not time_step.is_last():
                action_step = policy.action(time_step)
                time_step = eval_env.step(action_step.action)
                video.append_data(eval_py_env.render())
    return embed_mp4(filename)

create_policy_eval_video(agent.policy, "trained-agent")
```

WARNING:root:IMAGEIO FFMPEG_WRITER WARNING: input image is not divisible by macro_block_size=16, resizing from (400, 600) to (400, 608) to ensure video compatibility with most codecs and players. To prevent resizing, make your input image divisible by the macro_block_size or set the macro_block_size to None (risking incompatibility). You may also see a FFMPEG warning concerning speedloss due to data not being aligned.
 /usr/local/lib/python3.7/dist-packages/imageio/plugins/ffmpeg.py:727: DeprecationWarning: tostring() is deprecated. Use tobytes() instead.
 self._proc.stdin.write(im.tostring())

Out[29]:

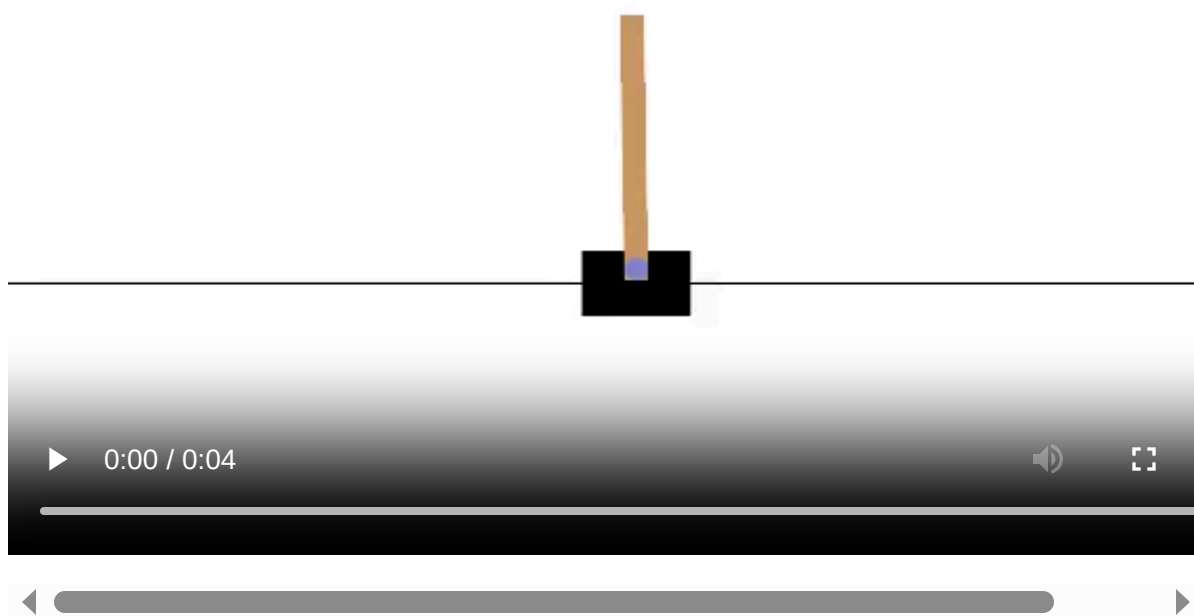


For fun, compare the trained agent (above) to an agent moving randomly. (It does not do as well.)

```
In [30]: # HIDE OUTPUT
create_policy_eval_video(random_policy, "random-agent")
```

```
WARNING:root:IMAGEIO FFMPEG_WRITER WARNING: input image is not divisible by
macro_block_size=16, resizing from (400, 600) to (400, 608) to ensure video
compatibility with most codecs and players. To prevent resizing, make your i
nput image divisible by the macro_block_size or set the macro_block_size to
None (risking incompatibility). You may also see a FFMPEG warning concerning
speedloss due to data not being aligned.
/usr/local/lib/python3.7/dist-packages/imageio/plugins/ffmpeg.py:727: Deprec
ationWarning: tostring() is deprecated. Use tobytes() instead.
  self._proc.stdin.write(im.tostring())
```

Out[30]:





T81-558: Applications of Deep Neural Networks

Module 12: Reinforcement Learning

- Instructor: [Jeff Heaton](#), McKelvey School of Engineering, [Washington University in St. Louis](#)
- For more information visit the [class website](#).

Module 12 Video Material

- Part 12.1: Introduction to the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
- Part 12.2: Introduction to Q-Learning [\[Video\]](#) [\[Notebook\]](#)
- Part 12.3: Keras Q-Learning in the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
- **Part 12.4: Atari Games with Keras Neural Networks** [\[Video\]](#) [\[Notebook\]](#)
- Part 12.5: Application of Reinforcement Learning [\[Video\]](#) [\[Notebook\]](#)

Google CoLab Instructions

The following code ensures that Google CoLab is running the correct version of TensorFlow, and has the necessary Python libraries installed.

```
In [1]: # HIDE OUTPUT
try:
    from google.colab import drive
    %tensorflow_version 2.x
    COLAB = True
    print("Note: using Google CoLab")
except:
    print("Note: not using Google CoLab")
    COLAB = False

if COLAB:
    !sudo apt-get install -y xvfb ffmpeg
    !pip install -q ale-py
    !pip install -q 'gym==0.17.3'
    !pip install -q 'imageio==2.4.0'
    !pip install -q PILLOW
    !pip install -q 'pyglet==1.3.2'
    !pip install -q pyvirtualdisplay
```

```
!pip install -q --upgrade tensorflow-probability
!pip install -q 'tf-agents==0.12.0'
```

Note: using Google CoLab

Reading package lists... Done

Building dependency tree

Reading state information... Done

ffmpeg is already the newest version (7:3.4.8-0ubuntu0.2).

The following NEW packages will be installed:

xvfb

0 upgraded, 1 newly installed, 0 to remove and 39 not upgraded.

Need to get 784 kB of archives.

After this operation, 2,271 kB of additional disk space will be used.

Get:1 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 xvfb amd64 2:1.19.6-1ubuntu4.10 [784 kB]

Fetched 784 kB in 0s (7,462 kB/s)

debconf: unable to initialize frontend: Dialog

debconf: (No usable dialog-like program is installed, so the dialog based frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 76, <> line 1.)

debconf: falling back to frontend: Readline

debconf: unable to initialize frontend: Readline

debconf: (This frontend requires a controlling tty.)

debconf: falling back to frontend: Teletype

dpkg-preconfigure: unable to re-open stdin:

Selecting previously unselected package xvfb.

(Reading database ... 156210 files and directories currently installed.)

Preparing to unpack .../xvfb_2%3a1.19.6-1ubuntu4.10_amd64.deb ...

Unpacking xvfb (2:1.19.6-1ubuntu4.10) ...

Setting up xvfb (2:1.19.6-1ubuntu4.10) ...

Processing triggers for man-db (2.8.3-2ubuntu0.1) ...

|██| 1.6 MB 11.4 MB/s

|██| 3.3 MB 15.2 MB/s

Building wheel for imageio (setup.py) ... done

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

albumations 0.1.12 requires imgaug<0.2.7,>=0.2.5, but you have imgaug 0.2.9 which is incompatible.

|██| 1.0 MB 16.5 MB/s

ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.

gym 0.17.3 requires pygame<=1.5.0,>=1.4.0, but you have pygame 1.3.2 which is incompatible.

|██| 1.3 MB 15.4 MB/s

|██| 1.0 MB 53.4 MB/s

Part 12.4: Atari Games with Keras Neural Networks

The Atari 2600 is a home video game console from Atari, Inc., Released on September 11, 1977. Most credit the Atari with popularizing microprocessor-based hardware and

games stored on ROM cartridges instead of dedicated hardware with games built into the unit. Atari bundled their console with two joystick controllers, a conjoined pair of paddle controllers, and a game cartridge: initially [Combat](#)), and later [Pac-Man](#)).

Atari emulators are popular and allow gamers to play many old Atari video games on modern computers. These emulators are even available as JavaScript.

- [Virtual Atari](#)

Atari games have become popular benchmarks for AI systems, particularly reinforcement learning. OpenAI Gym internally uses the [Stella Atari Emulator](#). You can see the Atari 2600 in Figure 12.ATARI.

Figure 12.ATARI: The Atari 2600



Actual Atari 2600 Specs

- CPU: 1.19 MHz MOS Technology 6507
- Audio + Video processor: Television Interface Adapter (TIA)
- Playfield resolution: 40 x 192 pixels (NTSC). It uses a 20-pixel register that is mirrored or copied, left side to right side, to achieve the width of 40 pixels.
- Player sprites: 8 x 192 pixels (NTSC). Player, ball, and missile sprites use pixels 1/4 the width of playfield pixels (unless stretched).
- Ball and missile sprites: 1 x 192 pixels (NTSC).
- Maximum resolution: 160 x 192 pixels (NTSC). Max resolution is achievable only with programming tricks that combine sprite pixels with playfield pixels.
- 128 colors (NTSC). 128 possible on screen. Max of 4 per line: background, playfield, player0 sprite, and player1 sprite. Palette switching between lines is common.

Palette switching mid-line is possible but not common due to resource limitations.

- 2 channels of 1-bit monaural sound with 4-bit volume control.

OpenAI Lab Atari Pong

You can use OpenAI Gym with Windows; however, it requires a special [installation procedure](#).

This chapter demonstrates playing [Atari Pong](#). Pong is a two-dimensional sports game that simulates table tennis. The player controls an in-game paddle by moving it vertically across the left or right side of the screen. They can compete against another player controlling a second paddle on the opposing side. Players use the paddles to hit a ball back and forth. The goal is for each player to reach eleven points before the opponent; you earn points when one fails to return it to the other. For the Atari 2600 version of Pong, a computer player (controlled by the Atari 2600) is the opposing player.

This section shows how to adapt TF-Agents to an Atari game. You can quickly adapt this example to any Atari game by simply changing the environment name. However, I tuned the code presented here for Pong, and it may not perform as well for other games. Some tuning will likely be necessary to produce a good agent for other games. Compared to the pole-cart game presented earlier in this chapter, some changes are required.

We begin by importing the needed Python packages.

```
In [2]: import base64
import imageio
import IPython
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import PIL.Image
import pyvirtualdisplay

import tensorflow as tf

from tf_agents.agents.dqn import dqn_agent
from tf_agents.drivers import dynamic_step_driver
from tf_agents.environments import suite_gym, suite_atari
from tf_agents.environments import tf_py_environment
from tf_agents.environments import batched_py_environment
from tf_agents.eval import metric_utils
from tf_agents.metrics import tf_metrics
from tf_agents.networks import q_network, network
from tf_agents.policies import random_tf_policy
from tf_agents.replay_buffers import tf_uniform_replay_buffer
from tf_agents.trajectories import trajectory
from tf_agents.utils import common
```



```

from tf_agents.agents.categorical_dqn import categorical_dqn_agent
from tf_agents.networks import categorical_q_network

from tf_agents.specs import tensor_spec
from tf_agents.trajectories import time_step as ts

# Set up a virtual display for rendering OpenAI gym environments.
display = pyvirtualdisplay.Display(visible=0, size=(1400, 900)).start()

```

Hyperparameters

The hyperparameter names are the same as the previous DQN example; however, I tuned the numeric values for the more complex Atari game.

```

In [4]: # 10K already takes awhile to complete, with minimal results.
# To get an effective agent requires much more.
num_iterations = 10000

initial_collect_steps = 200
collect_steps_per_iteration = 10
replay_buffer_max_length = 100000

batch_size = 32
learning_rate = 2.5e-3
log_interval = 1000

num_eval_episodes = 5
eval_interval = 25000

```

The algorithm needs more iterations for an Atari game. I also found that increasing the number of collection steps helped the algorithm train.

Atari Environment

You must handle Atari environments differently than games like cart-pole. Atari games typically use their 2D displays as the environment state. AI Gym represents Atari games as either a 3D (height by width by color) state spaced based on their screens or a vector representing the game's computer RAM state. To preprocess Atari games for greater computational efficiency, we skip several frames, decrease the resolution, and discard color information. The following code shows how we can set up an Atari environment.

```

In [5]: # HIDE OUTPUT
! wget http://www.atarimania.com/roms/Roms.rar
! mkdir /content/ROM/
! unrar e -o+ /content/Roms.rar /content/ROM/
! python -m atari_py.import_roms /content/ROM/

```

```
--2022-04-02 18:47:11-- http://www.atarimania.com/roms/Roms.rar
Resolving www.atarimania.com (www.atarimania.com)... 195.154.81.199
Connecting to www.atarimania.com (www.atarimania.com)|195.154.81.199|:80...
connected.
HTTP request sent, awaiting response... 200 OK
Length: 19583716 (19M) [application/x-rar-compressed]
Saving to: 'Roms.rar'
```

```
Roms.rar          100%[=====>]  18.68M  4.78MB/s   in 3.9s
```

```
2022-04-02 18:47:15 (4.76 MB/s) - 'Roms.rar' saved [19583716/19583716]
```

```
UNRAR 5.50 freeware      Copyright (c) 1993-2017 Alexander Roshal
```

```
Extracting from /content/Roms.rar
```

```
Extracting /content/ROM/128 in 1 Game Select ROM (Unknown) ~.bin
0000 0%000000 OK
Extracting /content/ROM/2 in 1 - Chess, Othello (Atari) (Prototype).bin
0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Cavern Blaster, City War (1992) (HE
S) (773-867) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Challenge, Surfing (1990) (HES) (77
1-333) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Dolphin, Oink (1990) (HES) (771-34
1) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Dolphin, Pigs n' Wolf (1990) (HES)
(771-341) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Dungeon Master, Creature Strike (19
92) (HES) (773-891) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Hoppy, Alien Force (1992) (HES) (77
3-875) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Moto-Cross, Boom Bang (1990) (HES)
(701-157) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Space Voyage, Fire Alert (1992) (HE
S) (773-883) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Star Warrior, Frogger (1990) (HES)
(771-422) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/2 Pak Special - Wall Defender, Planet Patrol (1990)
(HES) (771-406) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/208 in 1 Game Select ROM (Unknown) (PAL) ~.bin
0000 0%000000 OK
Extracting /content/ROM/3-D Genesis (1983) (Amiga - Video Soft, Jerry Lawso
n, Dan McElroy) (Prototype) ~.bin 0000 0%000000 OK
Extracting /content/ROM/3-D Ghost Attack (1983) (Amiga - Video Soft, Michae
l K. Glass, Jerry Lawson) (Prototype) ~.bin 0000 0%000000 OK
Extracting /content/ROM/3-D Havoc (1983) (Amiga - Video Soft, Frank Ellis,
Jerry Lawson) (2110) (Prototype) ~.bin 0000 0%000000 OK
Extracting /content/ROM/3-D Tic-Tac-Toe (1980) (Atari, Carol Shaw - Sears)
(CX2618 - 49-75123) ~.bin 0000 0%000000 OK
Extracting /content/ROM/3-D Tic-Tac-Toe (1980) (Atari, Carol Shaw) (CX2618,
CX2618P) (PAL).bin 0000 0%000000 OK
Extracting /content/ROM/3-D Zapper (12-15-82) (U.S. Games Corporation - JWD
A, Todd Marshall) (Prototype) ~.bin 0000 0%000000 OK
```

```

Extracting /content/ROM/3-D Zapper (U.S. Games Corporation - JWDA, Todd Mar
shall) (Prototype).bin      0000 0%000000 OK
Extracting /content/ROM/32 in 1 Console ROM (02-10-1989) (Atari) (Prototyp
e) (PAL).bin      0000 0%000000 OK
Extracting /content/ROM/32 in 1 Game Cartridge (1988) (Atari) (CX26163P) (P
AL).bin      0000 1%000000 OK
Extracting /content/ROM/3D Tic-Tac-Toe (32 in 1) (1988) (Atari, Carol Shaw)
(CX26163P) (PAL).bin      0000 1%000000 OK
Extracting /content/ROM/4 Game in One - Ice Hockey, Phantom UFO, Spy Vs. Sp
y, Cosmic Avenger (1983) (Bit Corporation) (PAL).bin      0000 1%000000 OK
Extracting /content/ROM/4 Game in One - Rodeo Champ, Open Sesame, Bobby Is
Going Home, Festival (1983) (Bit Corporation) (P460) (PAL).bin      0000
1%000000 OK
Extracting /content/ROM/4 in 1 - Canyon Bomber, Home Run, Night Driver, Sky
Diver (02-19-1987) (Atari) (CX26137) (Prototype).bin      0000 1%000000 OK
Extracting /content/ROM/8 in 1 (Supergames 8 in 1) (01-16-92) (Atari) (CX26
193) (Prototype).bin      0000 1%000000 OK
Extracting /content/ROM/===== ROM HUNTER'S 1977-1992 VCS ROMS COLLECTIO
N V17 =====.txt      0000 1%000000 OK
Extracting /content/ROM/A-Team, The (AKA Saboteur) (03-30-1984) (Atari, Jer
ome Domurat, Howard Scott Warshaw) (CX26133) (Prototype).bin      0000
1%000000 OK
Extracting /content/ROM/A-Team, The (AKA Saboteur) (05-08-1984) (Atari, Jer
ome Domurat, Howard Scott Warshaw) (CX26133) (Prototype).bin      0000
1%000000 OK
Extracting /content/ROM/Acid Drop (1992) (Salu, Dennis M. Kiss) (460758) (P
AL) ~.bin      0000 1%000000 OK
Extracting /content/ROM/Action Man - Action Force (AKA G.I. Joe - Cobra Str
ike) (Paddle) (1983) (Parker Brothers, John Emerson) (931511) (PAL).bin
0000 1%000000 OK
Extracting /content/ROM/Actionauts (Microbots) (1984-2008) (Imagic - Advanc
ed Program Technology, Rob Fulop) ~.bin      0000 1%000000 OK
Extracting /content/ROM/Activision Decathlon, The (1983) (Activision, David
Crane) (AG-930-04, AZ-030) [fixed] ~.bin      0000 1%000000 OK
Extracting /content/ROM/Activision Decathlon, The (1983) (Activision, David
Crane) (AG-930-04, AZ-030) ~.bin      0000 1%000000 OK
Extracting /content/ROM/Activision Decathlon, The (1983) (Activision, David
Crane) (EAZ-030) (SECAM).bin      0000 1%000000 OK
Extracting /content/ROM/Activision Decathlon, The - Zehnkampf (1983) (Activ
ision, David Crane - Ariola) (EAZ-030, EAZ-030-04B, EAZ-030-04I - 711 030-72
5) (PAL).bin      0000 1%000000 OK
Extracting /content/ROM/Adventure (1980) (Atari, Warren Robinett - Sears)
(CX2613 - 49-75154) ~.bin      0000 1%000000 OK
Extracting /content/ROM/Adventure (1980) (Atari, Warren Robinett) (CX2613,
CX2613P) (PAL).bin      0000 1%000000 OK
Extracting /content/ROM/Adventures of TRON (TRON Joystick) (1983) (M Networ
k - INTV - Aph Technological Consulting, Hal Finney, Glenn Hightower, Peter
Kaminski) (MT4317) ~.bin      0000 1%000000 OK
Extracting /content/ROM/Adventures on GX-12 (AKA Adventures of TRON) (1988)
(Telegames) (4317 A009) (PAL).bin      0000 1%000000 OK
Extracting /content/ROM/Air Raid (Men-A-Vision) (PAL) ~.bin
0000 1%000000 OK
Extracting /content/ROM/Air Raiders (Air Battle) (1983) (M Network - INTV -
Aph Technological Consulting, Larry Zwick) (MT5861) ~.bin      0000 1%000000
OK
Extracting /content/ROM/Air Raiders (Hack) (32 in 1) (Bit Corporation) (R32

```

```

0).bin      1%      OK
Extracting /content/ROM/Air Raiders (Unknown) (PAL).bin
1%      OK
Extracting /content/ROM/Air-Sea Battle (32 in 1) (1988) (Atari, Larry Kapla
n) (CX26163P) (PAL).bin      1%      OK
Extracting /content/ROM/Air-Sea Battle (Hack) (Unknown) (4K).bin
1%      OK
Extracting /content/ROM/Air-Sea Battle - Air Sea Battle (Anti-Aircraft) (19
77) (Atari, Larry Kaplan) (CX2602, CX2602P) (PAL).bin      1%      OK
Extracting /content/ROM/Air-Sea Battle - Air Sea Battle - Target Fun (Anti-
Aircraft) (1977) (Atari, Larry Kaplan - Sears) (CX2602 - 99802, 6-99802, 49-
75102) ~.bin      1%      OK
Extracting /content/ROM/Airlock (1982) (Data Age) (DA1004) (Prototype).bin
1%      OK
Extracting /content/ROM/Airlock (1982) (Data Age) (DA1004) ~.bin
1%      OK
Extracting /content/ROM/Airlock (1983) (Gameworld) (133-004) (PAL).bin
1%      OK
Extracting /content/ROM/Alices Abenteuer - Lilly Adventure (1983) (Quelle -
Otto Versand) (732.273 8 - 600273, 781644) (PAL).bin      1%      OK
Extracting /content/ROM/Alien (1982) (20th Century Fox Video Games, Douglas
'Dallas North' Neubauer) (11006) ~.bin      1%      OK
Extracting /content/ROM/Alien (CCE).bin
2%      OK
Extracting /content/ROM/Alien's Return (AKA Go Go Home) (1983) (ITT Family
Games) (554-33 391) (PAL).bin      2%      OK
Extracting /content/ROM/Alligator People (1983) (20th Century Fox Video Gam
es, John Russell) (Prototype) ~.bin      2%      OK
Extracting /content/ROM/Alpha Beam with Ernie (Alpha Beam) (Kid's Controlle
r) (06-03-1983) (Atari - CCW, Michael Callahan, Preston Stuart) (CX26103) (P
rototype) (PAL).bin      2%      OK
Extracting /content/ROM/Alpha Beam with Ernie (Alpha Beam) (Kid's Controlle
r) (12-22-1982) (Atari - CCW, Michael Callahan, Preston Stuart) (CX26103) (P
rototype).bin      2%      OK
Extracting /content/ROM/Alpha Beam with Ernie (Alpha Beam) (Kid's Controlle
r) (1983) (Atari - CCW, Michael Callahan, Preston Stuart) (CX26103) (PAL).bi
n      2%      OK
Extracting /content/ROM/Alpha Beam with Ernie (Alpha Beam) (Kid's Controlle
r) (1983) (Atari - CCW, Michael Callahan, Preston Stuart) (CX26103) ~.bin
2%      OK
Extracting /content/ROM/Amidar (1982) (Parker Brothers, Ed Temple) (931504)
(PAL).bin      2%      OK
Extracting /content/ROM/Amidar (1982) (Parker Brothers, Ed Temple) (PB5310)
~.bin      2%      OK
Extracting /content/ROM/Amidar (Hack) (32 in 1) (Bit Corporation) (R320).bi
n      2%      OK
Extracting /content/ROM/AndroMan on the Moon (1984) (Androbot - Western Tec
hnologies, Michael Case, Lenny Carlson) (Prototype) ~.bin      2%      OK
Extracting /content/ROM/Angeln I (AKA Fishing Derby) (Videospielkassette -
Ariola) (PGP237) (PAL).bin      2%      OK
Extracting /content/ROM/Angriff der Luftflotten - Paris Attack (AKA M.A.D.)
(1983) (Quelle - Otto Versand) (495.463 2 - 746381) (PAL).bin      2%      OK
Extracting /content/ROM/Ant Party (AKA Cosmic Swarm) (32 in 1) (1988) (Atar
i) (CX26163P) (PAL).bin      2%      OK

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```

Extracting /content/ROM/Apples and Dolls (AKA Open, Sesame!) (CCE).bin
0000 2%000000 OK
Extracting /content/ROM/Aquatak (AKA Skindiver) (1983) (John Sands Electron
ics) (JS145C) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Aquaventure (CCE).bin
0000 2%000000 OK
Extracting /content/ROM/Aquaventure (Sea Sentinel) (08-12-1983) (Atari, Tod
Frye, Gary Shannon) (Prototype) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Arkyology (1983) (Sparrow - Enter-Tech, Rick Harri
s, George Hefner, Paul Walters, Barbara Ultis) (Prototype) ~.bin 0000
2%000000 OK
Extracting /content/ROM/Armor Ambush (1988) (Telegames) (PAL).bin
0000 2%000000 OK
Extracting /content/ROM/Armor Ambush (Tank Battle) (1982) (M Network - INTV
- APH Technological Consulting, Hal Finney) (MT5661) ~.bin 0000 2%000000
OK
Extracting /content/ROM/Artillery Duel (1983) (Xonox - K-Tel Software - Act
ion Graphics, Michael Schwartz, David Thiel) (6230, 7210, 06004, 99004) (PA
L).bin 0000 2%000000 OK
Extracting /content/ROM/Artillery Duel (1983) (Xonox - K-Tel Software - Act
ion Graphics, Michael Schwartz, David Thiel) (6230, 7210, 06004, 99004) ~.bi
n 0000 2%000000 OK
Extracting /content/ROM/Ases do Ar (AKA Sky Jinks) (Dismac).bin
0000 2%000000 OK
Extracting /content/ROM/Assault (AKA Sky Alien) (1983) (Bomb - Onbase) (CA2
81) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Assault (AKA Sky Alien) (1983) (Bomb - Onbase) (CA2
81).bin 0000 2%000000 OK
Extracting /content/ROM/Asterix (AKA Taz) (08-01-1983) (Atari, Jerome Domur
at, Steve Woita) (CX2696) (Prototype) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Asterix (AKA Taz) (1984) (Atari, Jerome Domurat, St
eve Woita) (CX2696) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Asterix (AKA Taz) (1984) (Atari, Jerome Domurat, St
eve Woita) (CX2696).bin 0000 2%000000 OK
Extracting /content/ROM/Asteroid Belt (AKA Asteroid Fire) (1983) (Suntek)
(SS-029) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Asteroid Fire (1983) (Home Vision - Gem Internation
al Corporation - VDI) (VCS83111) (PAL) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart - Sears) (CX2
649 - 49-75163) [no copyright] ~.bin 0000 2%000000 OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart - Sears) (CX2
649 - 49-75163) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart) (CX2649, CX2
649P) (PAL) [no copyright].bin 0000 2%000000 OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart) (CX2649, CX2
649P) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Astro Attack (AKA Time Warp) (1983) (Goliath - Hot
Shot) (83-214) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Astro Chase (10-25-1983) (Parker Brothers - First S
tar Software, Alex Leavens) (Prototype) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Astroblast (Paddle) (1982) (M Network - INTV - APH
Technological Consulting, Hal Finney) (MT5666) [fixed] ~.bin 0000
2%000000 OK
Extracting /content/ROM/Astroblast (Paddle) (1982) (M Network - INTV - APH
Technological Consulting, Hal Finney) (MT5666) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Astroblast (Paddle) (1988) (Telegames) (PAL).bin

```

```

0000 2%000000 OK
Extracting /content/ROM/Astrowar (1983) (Goliath) (2) (PAL).bin
0000 2%000000 OK
Extracting /content/ROM/Astrowar (Astrobattle) (Dimax - Sinmax) (SM8002) (PAL) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Astrowar (Unknown).bin
0000 2%000000 OK
Extracting /content/ROM/Atari VCS Point-of-Purchase ROM (1982) (Atari) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Atari Video Cube (Atari Cube, Video Cube) (1983) (Atari - GCC) (CX2670) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Atlantis (1983) (CCE) (C-832) [a].bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (1983) (CCE) (C-832).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (1983) (Digitel).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (1983) (Dynacom).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (Dactari - Milmar).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (Fotomania).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (Hack) (32 in 1) (Bit Corporation) (R320).bin 0000 2%000000 OK
Extracting /content/ROM/Atlantis (Hack) (Unknown) (PAL) [a].bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (Hack) (Unknown) (PAL).bin
0000 2%000000 OK
Extracting /content/ROM/Atlantis (Lost City of Atlantis) (1982) (Imagic, Dennis Koble) (720103-1A, 720103-1B, IA3203, IX-010-04) ~.bin 0000 2%000000 OK
Extracting /content/ROM/Atlantis (Lost City of Atlantis) (1982) (Imagic, Dennis Koble) (720103-2A, IA3203P, EIX-010-04I) (PAL).bin 0000 2%000000 OK
Extracting /content/ROM/Atlantis II (1982) (Imagic, Dennis Koble) (720103-1A, IA3203).bin 0000 2%000000 OK
Extracting /content/ROM/Atom Smasher (1984) (Video Soft) (Prototype) [stack pointer fix] ~.bin 0000 3%000000 OK
Extracting /content/ROM/Atom Smasher (1984) (Video Soft) (Prototype).bin
0000 3%000000 OK
Extracting /content/ROM/Aufruhr im Zoo (AKA Pumuckl at the Zoo) (1983) (Quelle) (719.694 2) (PAL).bin 0000 3%000000 OK
Extracting /content/ROM/Autorennen (AKA Grand Prix) (Videospielkassette - Ariola) (PGP232) (PAL).bin 0000 3%000000 OK
Extracting /content/ROM/Bachelor Party (Paddle) (1982) (Mystique - American Multiple Industries, Joel H. Martin) (1002) ~.bin 0000 3%000000 OK
Extracting /content/ROM/Bachelor Party (Paddle) (1982) (PlayAround - JHM) (205).bin 0000 3%000000 OK
Extracting /content/ROM/Bachelorette Party (AKA Bachelor Party) (Paddle) (1982) (PlayAround - JHM) (202).bin 0000 3%000000 OK
Extracting /content/ROM/Backgammon (Paddle) (1979) (Atari, Craig Nelson - Sears) (CX2617 - 49-75183) ~.bin 0000 3%000000 OK
Extracting /content/ROM/Backgammon (Paddle) (1979) (Atari, Craig Nelson) (CX2617, CX2617P) (PAL).bin 0000 3%000000 OK
Extracting /content/ROM/Bank Heist (Bonnie & Clyde, Cops 'n' Robbers, Hold-

```

```

Up, Roaring 20's) (1983) (20th Century Fox Video Games, Bill Aspromonte) (11
012) ~.bin      0000 3%000000 OK
Extracting /content/ROM/Bank Heist (Hack) (32 in 1) (Bit Corporation) (R32
0).bin      0000 3%000000 OK
Extracting /content/ROM/Bank Heist (Unknown) (PAL) [a].bin
0000 3%000000 OK
Extracting /content/ROM/Bank Heist (Unknown) (PAL).bin
0000 3%000000 OK
Extracting /content/ROM/Barnstorming (1982) (Activision, Steve Cartwright)
(AX-013) ~.bin      0000 3%000000 OK
Extracting /content/ROM/Barnstorming (CCE).bin
0000 3%000000 OK
Extracting /content/ROM/Barnstorming (Unknown) (PAL) [a].bin
0000 3%000000 OK
Extracting /content/ROM/Barnstorming (Unknown) (PAL).bin
0000 3%000000 OK
Extracting /content/ROM/Barnstorming - Die tollkeuhnen Flieger (1982) (Acti
vision, Steve Cartwright - Ariola) (EAX-013, PAX-013 - 711 013-720) (PAL).bi
n      0000 3%000000 OK
Extracting /content/ROM/Base Attack (1983) (Home Vision - Gem International
Corporation - VDI) (VCS83113) (PAL) ~.bin      0000 3%000000 OK
Extracting /content/ROM/Base Attack (Hack) (Unknown).bin
0000 3%000000 OK
Extracting /content/ROM/Baseball (AKA Super Challenge Baseball) (1988) (Tel
egames) (5665 A016) (PAL).bin      0000 3%000000 OK
Extracting /content/ROM/Baseball (AKA Super Challenge Baseball) (1988) (Tel
egames) (5665 A016).bin      0000 3%000000 OK
Extracting /content/ROM/Basic Math (Math Pack) (1977) (Atari, Gary Palmer)
(CX2661) (PAL).bin      0000 3%000000 OK
Extracting /content/ROM/Basic Math (Unknown) (PAL).bin
0000 3%000000 OK
Extracting /content/ROM/Basic Math - Math (Math Pack) (1977) (Atari, Gary P
almer - Sears) (CX2661 - 99808, 6-99808) ~.bin      0000 3%000000 OK
Extracting /content/ROM/BASIC Programming (Keyboard Controller) (1979) (Ata
ri, Warren Robinett) (CX2620) ~.bin      0000 3%000000 OK
Extracting /content/ROM/BASIC Programming (Keyboard Controller) (1979) (Ata
ri, Warren Robinett) (CX2620, CX2620P) (PAL).bin      0000 3%000000 OK
Extracting /content/ROM/Basketball (1978) (Atari, Alan Miller - Sears) (CX2
624 - 6-99826, 49-75113) ~.bin      0000 3%000000 OK
Extracting /content/ROM/Basketball (1978) (Atari, Alan Miller) (CX2624, CX2
624P) (PAL).bin      0000 3%000000 OK
Extracting /content/ROM/Basketball (32 in 1) (1988) (Atari, Alan Miller) (C
X26163P) (PAL).bin      0000 3%000000 OK
Extracting /content/ROM/Basketball (Hack) (32 in 1) (Bit Corporation) (R32
0).bin      0000 3%000000 OK
Extracting /content/ROM/Basketball (Hack) (Unknown) (PAL).bin
0000 3%000000 OK
Extracting /content/ROM/Basketball (Unknown) (PAL).bin
0000 3%000000 OK
Extracting /content/ROM/Battlezone (05-02-1983) (Atari - GCC, Mike Feinstei
n, Brad Rice) (CX2681) (Prototype).bin      0000 3%000000 OK
Extracting /content/ROM/Battlezone (05-12-1983) (Atari - GCC, Mike Feinstei
n, Brad Rice) (CX2681) (Prototype).bin      0000 3%000000 OK
Extracting /content/ROM/Battlezone (1983) (Atari - GCC, Mike Feinstein, Bra
d Rice) (CX2681) ~.bin      0000 3%000000 OK
Extracting /content/ROM/Battlezone (1983) (Atari - GCC, Mike Feinstein, Bra

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d Rice) (CX2681, CX2681P) (PAL).bin      3% OK
Extracting /content/ROM/Beamrider (1984) (Activision - Cheshire Engineerin
g, David Rolfe, Larry Zwick) (AZ-037-04) ~.bin      3% OK
Extracting /content/ROM/Beamrider (1984) (Activision - Cheshire Engineerin
g, David Rolfe, Larry Zwick) (EAZ-037-04, EAZ-037-04I) (PAL).bin      3% OK
Extracting /content/ROM/Beany Bopper (1982) (20th Century Fox Video Games -
Sirius Software, Grady Ward) (11002) ~.bin      3% OK
Extracting /content/ROM/Beany Bopper (1983) (CCE) (C-835).bin
3% OK
Extracting /content/ROM/Bear Game Demo (Paddle) (1983) (SEGA, Fred Mack) ~.
bin      3% OK
Extracting /content/ROM/Beat 'Em & Eat 'Em (Paddle) (1982) (Mystique - Amer
ican Multiple Industries, Joel H. Martin) (1003) ~.bin      3% OK
Extracting /content/ROM/Beat 'Em & Eat 'Em (Paddle) (1982) (Mystique - Amer
ican Multiple Industries, Joel H. Martin) (PAL).bin      3% OK
Extracting /content/ROM/Beat 'Em & Eat 'Em (Paddle) (1982) (PlayAround - JH
M) (204).bin      3% OK
Extracting /content/ROM/Beat 'Em & Eat 'Em (Paddle) (1983) (Dynacom).bin
3% OK
Extracting /content/ROM/Berenstain Bears (Kid Vid Voice Module) (1983) (Col
eco) (2658) ~.bin      3% OK
Extracting /content/ROM/Bermuda (AKA River Raid) (1983) (Quelle) (322.913
5) (PAL).bin      3% OK
Extracting /content/ROM/Bermuda (AKA River Raid) (Unknown) (PAL).bin
3% OK
Extracting /content/ROM/Bermuda (AKA River Raid) (Unknown).bin
3% OK
Extracting /content/ROM/Bermuda Triangle (1983) (Data Age, J. Ray Dettling)
(112-007) ~.bin      3% OK
Extracting /content/ROM/Bermuda Triangle (1983) (Gameworld, J. Ray Dettlin
g) (133-007) (PAL).bin      3% OK
Extracting /content/ROM/Bermuda, The (AKA River Raid) (1983) (Rainbow Visio
n - Suntek) (SS-009) (PAL) [a].bin      3% OK
Extracting /content/ROM/Bermuda, The (AKA River Raid) (1983) (Rainbow Visio
n - Suntek) (SS-009) (PAL).bin      3% OK
Extracting /content/ROM/Berzerk (1982) (Atari, Dan Hitchens - Sears) (CX265
0 - 49-75168) ~.bin      3% OK
Extracting /content/ROM/Berzerk (1982) (Atari, Dan Hitchens) (CX2650) (PA
L).bin      3% OK
Extracting /content/ROM/Berzerk (CCE).bin
3% OK
Extracting /content/ROM/Berzerk (Unknown) (PAL) [a].bin
3% OK
Extracting /content/ROM/Berzerk (Unknown) (PAL).bin
3% OK
Extracting /content/ROM/Bi! Bi! (AKA Skindiver) (1983) (Rainbow Vision - Su
ntek) (SS-013) (PAL).bin      3% OK
Extracting /content/ROM/Bi! Bi! (AKA Skindiver) (2600 Screen Search Consol
e) (Jones Yuan Telephonic Enterprise Co) (PAL).bin      3% OK
Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (05-02-1983) (Atari - CCW, Christopher H. Omarzu) (CX26104) (Proto
type).bin      4% OK
Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (05-17-1983) (Atari - CCW, Christopher H. Omarzu) (CX26104) (Proto
type).bin      4% OK

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Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (12-08-1982) (Atari - CCW, Christopher H. Omarzu) (CX26104) (Proto
type).bin      0000 4%000000 OK
Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (1983) (Atari - CCW, Christopher H. Omarzu) (CX26104) (PAL).bin
0000 4%000000 OK
Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (1983) (Atari - CCW, Christopher H. Omarzu) (CX26104) ~.bin
0000 4%000000 OK
Extracting /content/ROM/Billard (AKA Trick Shot) (1983) (Quelle) (626.610
0) (PAL).bin    0000 4%000000 OK
Extracting /content/ROM/Bingo (AKA Dice Puzzle) (1983) (CCE) (C-868) (PAL).
bin      0000 4%000000 OK
Extracting /content/ROM/Bionic Breakthrough (Headband - Super Breakout) (Mi
ndlink Controller) (06-22-1984) (Atari, Paul Donaldson) (Prototype).bin
0000 4%000000 OK
Extracting /content/ROM/Bionic Breakthrough (Headband - Super Breakout) (Mi
ndlink Controller) (1984) (Atari, Paul Donaldson) (Prototype) ~.bin      0000
4%000000 OK
Extracting /content/ROM/Birthday Mania (Paddle) (1984) (Personal Games Comp
any, Robert Anthony Tokar) ~.bin      0000 4%000000 OK
Extracting /content/ROM/Black Hole (AKA Cosmic Ark) (Double-Game Package)
(1983) (Otto Versand) (311388) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/Blackjack (32 in 1) (Paddle) (1988) (Atari, Bob Whi
tehead) (CX26163P) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/Blackjack (Gambling) (Paddle) (1977) (Atari, Bob Wh
itehead) (CX2651) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/Blackjack (Paddle) (Unknown) (PAL) [a].bin
0000 4%000000 OK
Extracting /content/ROM/Blackjack (Paddle) (Unknown) (PAL).bin
0000 4%000000 OK
Extracting /content/ROM/Blackjack - Black Jack (Gambling) (Paddle) (1977)
(ATari, Bob Whitehead - Sears) (CX2651 - 99805, 49-75602) ~.bin      0000
4%000000 OK
Extracting /content/ROM/Bloody Human Freeway (Human Freeway, Splat!) (Freew
ay Beta) (1981) (Activision, David Crane) (AG-009) (Prototype).bin      0000
4%000000 OK
Extracting /content/ROM/Blueprint (1983) (CBS Electronics, Tom DiDomenico)
(4L 2486 5000) (Prototype).bin      0000 4%000000 OK
Extracting /content/ROM/Blueprint (1983) (CBS Electronics, Tom DiDomenico)
(4L 2486 5000) ~.bin      0000 4%000000 OK
Extracting /content/ROM/Blueprint (1983) (CBS Electronics, Tom DiDomenico)
(4L2477, 4L2482, 4L2485, 4L4171) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/BMX Air Master (1989) (Atari) (CX26190) (PAL).bin
0000 4%000000 OK
Extracting /content/ROM/BMX Air Master (1989) (Atari) (CX26190).bin
0000 4%000000 OK
Extracting /content/ROM/BMX Air Master (1989) (TNT Games - Sculptured Softw
are, Adam Clayton) (26192) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/BMX Air Master (1989) (TNT Games - Sculptured Softw
are, Adam Clayton) (26192) ~.bin      0000 4%000000 OK
Extracting /content/ROM/Bob Is Going Home (AKA Bobby Is Going Home) (JVP).b
in      0000 4%000000 OK
Extracting /content/ROM/Bobby geht nach Hause (AKA Bobby Is Going Home) (19
83) (Quelle) (476.774 5) (PAL).bin      0000 4%000000 OK
Extracting /content/ROM/Bobby Is Going Home (1983) (Bit Corporation) (PG20

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6).bin      4%      OK
Extracting /content/ROM/Bobby Is Going Home (2600 Screen Search Console) (J
one Yuan Telephonic Enterprise Co).bin      4%      OK
Extracting /content/ROM/Bobby Is Going Home (Fotomania).bin
4%      OK
Extracting /content/ROM/Bobby Is Going Home (Rentacom).bin
4%      OK
Extracting /content/ROM/Bobby Is Going Home - Bobby geht Heim (1983) (Bit C
orporation) (PG206) (PAL) [demonstration cartridge] ~.bin      4%      OK
Extracting /content/ROM/Bobby Is Going Home - Bobby geht Heim (1983) (Bit C
orporation) (PG206) (PAL) ~.bin      4%      OK
Extracting /content/ROM/Bobby Is Going Home - Bobby Vai Para Casa (1983) (C
CE) (C-803) (PAL).bin      4%      OK
Extracting /content/ROM/Bobby Is Going Home - Bobby Vai Para Casa (1983) (C
CE) (C-803).bin      4%      OK
Extracting /content/ROM/Bogey Blaster (AKA Air Raiders) (1988) (Telegames)
(5861 A030) (PAL).bin      4%      OK
Extracting /content/ROM/Bogey Blaster (AKA Air Raiders) (1988) (Telegames)
(5861 A030).bin      4%      OK
Extracting /content/ROM/Boggle (08-07-1978) (Atari, David Crane) (Prototyp
e) ~.bin      4%      OK
Extracting /content/ROM/Boing! (Bubbles, Soap Suds, The Emphysema Game) (19
83) (First Star Software, Alex Leavens, Shirley Ann Russell) (PAL).bin
4%      OK
Extracting /content/ROM/Boing! (Bubbles, Soap Suds, The Emphysema Game) (19
83) (First Star Software, Alex Leavens, Shirley Ann Russell) ~.bin      4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (1983) (Rainbow Vision -
Suntek) (SS-016) (PAL).bin      4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (HES) (PAL).bin
4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (Unknown) (PAL).bin
4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (Unknown) [a1].bin
4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (Unknown) [a2].bin
4%      OK
Extracting /content/ROM/Boom Bang (AKA Crackpots) (Unknown).bin
4%      OK
Extracting /content/ROM/Bouncin' Baby Bunnies (Baby Boom Boom, Bouncing Bab
y Monkeys) (1983) (Telesys, Alex Leavens) (Prototype) ~.bin      4%      OK
Extracting /content/ROM/Bowling (1979) (Atari, Larry Kaplan - Sears) (CX262
8 - 6-99842, 49-75117) ~.bin      4%      OK
Extracting /content/ROM/Bowling (1979) (Atari, Larry Kaplan) (CX2628, CX262
8P) (PAL).bin      4%      OK
Extracting /content/ROM/Bowling (32 in 1) (1988) (Atari, Larry Kaplan) (CX2
6163P) (PAL).bin      4%      OK
Extracting /content/ROM/Bowling (Hack) (32 in 1) (Bit Corporation) (R320).b
in      4%      OK
Extracting /content/ROM/Bowling (Unknown) (PAL).bin
4%      OK
Extracting /content/ROM/Boxen (AKA Boxing) (Videospielkassette - Ariola) (P
GP234) (PAL).bin      4%      OK
Extracting /content/ROM/Boxing (32 in 1) (1988) (Atari) (CX26163P) (PAL).bi

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n      0000 4%00000 OK
Extracting /content/ROM/Boxing (Dactari - Milmar).bin
0000 4%00000 OK
Extracting /content/ROM/Boxing (Unknown) (PAL) [a].bin
0000 5%00000 OK
Extracting /content/ROM/Boxing (Unknown) (PAL).bin
0000 5%00000 OK
Extracting /content/ROM/Boxing (Unknown).bin
0000 5%00000 OK
Extracting /content/ROM/Boxing - Box-Champion (1980) (Activision, Bob White
head - Ariola) (EAG-002, EAG-002-04I, PAG-002 - 711 002-715) (PAL).bin
0000 5%00000 OK
Extracting /content/ROM/Boxing - La Boxe (1980) (Activision, Bob Whitehead)
(AG-002, CAG-002, AG-002-04) ~.bin      0000 5%00000 OK
Extracting /content/ROM/Brain Games (Keyboard Controller) (1978) (Atari, La
rry Kaplan - Sears) (CX2664 - 6-99818) ~.bin      0000 5%00000 OK
Extracting /content/ROM/Brain Games (Keyboard Controller) (1978) (Atari, La
rry Kaplan) (CX2664, CX2664P) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Break-Down (AKA Wall Break) (1983) (Dynamics) (DY-1
92004) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Breakout (Paddle) (1978) (Atari, Brad Stewart) (CX2
622, CX2622P) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Breakout - Breakaway IV (Paddle) (1978) (Atari, Bra
d Stewart - Sears) (CX2622 - 6-99813, 49-75107) ~.bin      0000 5%00000 OK
Extracting /content/ROM/Bridge (1980) (Activision, Larry Kaplan - Ariola)
(EAX-006, PAX-006 - 771 006-720) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Bridge (1980) (Activision, Larry Kaplan) (AX-006)
[fixed] ~.bin      0000 5%00000 OK
Extracting /content/ROM/Bridge (1980) (Activision, Larry Kaplan) (AX-006)
~.bin      0000 5%00000 OK
Extracting /content/ROM/Bridge (Unknown) (PAL).bin
0000 5%00000 OK
Extracting /content/ROM/Buck Rogers - Planet of Zoom (1983) (SEGA - Teldec)
(005-01 - 3.60104 VG) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Buck Rogers - Planet of Zoom (1983) (SEGA) (005-01)
~.bin      0000 5%00000 OK
Extracting /content/ROM/Bugs (Paddle) (1982) (Data Age) (DA1005) ~.bin
0000 5%00000 OK
Extracting /content/ROM/Bugs (Paddle) (1983) (Gameworld) (133-005) (PAL).bi
n      0000 5%00000 OK
Extracting /content/ROM/Bugs Bunny (08-04-1983) (Atari, Alan J. Murphy, Rob
ert C. Polaro) (CX26100) (Prototype) ~.bin      0000 5%00000 OK
Extracting /content/ROM/Bugs Bunny (1983) (Atari, Alan J. Murphy, Robert C.
Polaro) (CX26100) (Prototype).bin      0000 5%00000 OK
Extracting /content/ROM/Bump 'n' Jump (1983) (M Network - INTV, David Aker
s, Joe King, Patricia Lewis Du Long, Jeff Ratcliff) (MT7045) ~.bin      0000
5%00000 OK
Extracting /content/ROM/Bump 'n' Jump (1988) (Telegames) (7045 A015) (PAL).
bin      0000 5%00000 OK
Extracting /content/ROM/Bumper Bash (Paddle) (1983) (Spectravideo, David Lu
bar) (SA-218) ~.bin      0000 5%00000 OK
Extracting /content/ROM/Bumper Bash (Paddle) (1983) (Spectravideo, David Lu
bar) (SA-218, SA-218C) (PAL).bin      0000 5%00000 OK
Extracting /content/ROM/Bumper Bash (Unknown) (PAL).bin
0000 5%00000 OK
Extracting /content/ROM/BurgerTime (1983) (M Network - INTV, Patricia Lewis

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Du Long, Ron Surratt) (MT4518) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Burning Desire (1982) (Mystique - American Multiple
Industries) (1003) (PAL) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Burning Desire (1982) (PlayAround - JHM) (202).bin
0000 5%000000 OK
Extracting /content/ROM/Busy Police (AKA Keystone Kapers) (Zellers).bin
0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (05-24-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (06-14-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (06-XX-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (07-03-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (07-27-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (08-21-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (09-04-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (09-07-
1984) (Coleco - Individeo, Ed Temple) (Prototype).bin      0000 5%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (09-13-
1984) (Coleco - Individeo, Ed Temple) (Prototype) [a].bin      0000 5%000000
OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (09-13-
1984) (Coleco - Individeo, Ed Temple) (Prototype) ~.bin      0000 5%000000 0
K
Extracting /content/ROM/Cakewalk (Bakery) (1983) (CommaVid, Irwin Gaines)
(CM-008) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Cakewalk - Alarm in der Backstube (Bakery) (1983)
(CommaVid, Irwin Gaines - Ariola) (CM-008 - 712 008-720) (PAL).bin      0000
5%000000 OK
Extracting /content/ROM/California Games (1987) (Epyx, Steven A. Baker, Pet
er Engelbrite) (80561-00286) (PAL).bin      0000 5%000000 OK
Extracting /content/ROM/California Games (1987) (Epyx, Steven A. Baker, Pet
er Engelbrite) (80561-00286) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Canyon Bomber (Paddle) (1979) (Atari, David Crane -
Sears) (CX2607 - 6-99828, 49-75115) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Canyon Bomber (Paddle) (Unknown) (PAL).bin
0000 5%000000 OK
Extracting /content/ROM/Capture (AKA Wall Break) (1983) (Goliath - Hot Sho
t) (83-314) (PAL).bin      0000 5%000000 OK
Extracting /content/ROM/Care Bears (1983) (Parker Brothers, Laura Nikolich)
(Prototype) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Carnival (1982) (Coleco - Woodside Design Associate
s, Steve 'Jessica Stevens' Kitchen) (2468) ~.bin      0000 5%000000 OK
Extracting /content/ROM/Carnival (1983) (CBS Electronics - Woodside Design
Associates, Steve 'Jessica Stevens' Kitchen) (4L1717, 4L1718, 4L1719, 4L227
7) (PAL).bin      0000 5%000000 OK
Extracting /content/ROM/Carnival (Hack) (Unknown) (PAL).bin
0000 5%000000 OK
Extracting /content/ROM/Casino (Paddle) (1979) (Atari, Bob Whitehead) (CX26
52, CX2652P) (PAL).bin      0000 5%000000 OK
Extracting /content/ROM/Casino - Poker Plus (Paddle) (1979) (Atari, Bob Whi

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thead - Sears) (CX2652 - 6-99816, 49-75151) ~.bin      6%      OK
Extracting /content/ROM/Cat Trax (1983) (UA Limited) (1) [a].bin
6%      OK
Extracting /content/ROM/Cat Trax (1983) (UA Limited) (1) ~.bin
6%      OK
Extracting /content/ROM/Catch Time (AKA Plaque Attack) (1983) (Rainbow Vision - Suntek) (SS-015) (PAL).bin      6%      OK
Extracting /content/ROM/Catch Time (AKA Plaque Attack) (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin      6%      OK
Extracting /content/ROM/Catch Time (AKA Plaque Attack) (Video Game Cartridge - Ariola) (TP-602) (PAL).bin      6%      OK
Extracting /content/ROM/Cathouse Blues (1982) (PlayAround - JHM) (201).bin
6%      OK
Extracting /content/ROM/Centipede (1982) (Atari - GCC) (CX2676) (Prototype) (PAL).bin      6%      OK
Extracting /content/ROM/Centipede (1983) (Atari - GCC) (CX2676) (PAL).bin
6%      OK
Extracting /content/ROM/Centipede (1983) (Atari - GCC) (CX2676) (Prototype).bin      6%      OK
Extracting /content/ROM/Centipede (1983) (Atari - GCC) (CX2676) ~.bin
6%      OK
Extracting /content/ROM/Challenge (HES) (PAL).bin
6%      OK
Extracting /content/ROM/Challenge (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Challenge (Unknown).bin
6%      OK
Extracting /content/ROM/Challenge (Zellers).bin
6%      OK
Extracting /content/ROM/Challenge of.... Nexar, The (1982) (Spectravision - Spectravideo - Sirius Software, David Lubar) (SA-206) (PAL).bin      6%      OK
Extracting /content/ROM/Challenge of.... Nexar, The (1982) (Spectravision - Spectravideo - Sirius Software, David Lubar) (SA-206) ~.bin      6%      OK
Extracting /content/ROM/Challenge of.... Nexar, The (Hack) (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin      6%      OK
Extracting /content/ROM/Challenge of.... Nexar, The (Unknown) (PAL) [a].bin
6%      OK
Extracting /content/ROM/Challenge of.... Nexar, The (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Championship Soccer (1980) (Atari, Steve Wright) (CX2616P) (PAL).bin      6%      OK
Extracting /content/ROM/Championship Soccer (Hack) (32 in 1) (Bit Corporation) (R320).bin      6%      OK
Extracting /content/ROM/Championship Soccer (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Championship Soccer - Soccer (1980) (Atari, Steve Wright - Sears) (CX2616 - 49-75155) ~.bin      6%      OK
Extracting /content/ROM/Chase the Chuck Wagon (1983) (Spectravideo - TMQ Software - Video Games Industries Corporation, Michael Schwartz - Ralston Purina) ~.bin      6%      OK
Extracting /content/ROM/Checkers (1980) (Activision, Alan Miller) (AG-003) ~.bin      6%      OK
Extracting /content/ROM/Checkers (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin      6%      OK

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Extracting /content/ROM/Checkers (32 in 1) (1988) (Atari) (CX26163P) (PAL).
bin      6%      OK
Extracting /content/ROM/Checkers (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Cheese (Dragonfire Beta) (05-21-1982) (Imagic, Bob
Smith) (720020-1A, IA3611) (Prototype).bin      6%      OK
Extracting /content/ROM/China Syndrome (1982) (Spectravision - Spectravide
o) (SA-205) (PAL).bin      6%      OK
Extracting /content/ROM/China Syndrome (1982) (Spectravision - Spectravide
o) (SA-205) ~.bin      6%      OK
Extracting /content/ROM/Chopper Command (1982) (Activision, Bob Whitehead)
(AX-015, AX-015-04) ~.bin      6%      OK
Extracting /content/ROM/Chopper Command (1982) (Fotomania).bin
6%      OK
Extracting /content/ROM/Chopper Command (1983) (CCE) (C-827) [a].bin
6%      OK
Extracting /content/ROM/Chopper Command (1983) (CCE) (C-827).bin
6%      OK
Extracting /content/ROM/Chopper Command (1983) (Digitel).bin
6%      OK
Extracting /content/ROM/Chopper Command (2600 Screen Search Console) (Jone
Yuan Telephonic Enterprise Co).bin      6%      OK
Extracting /content/ROM/Chopper Command (Hack) (2600 Screen Search Console)
(Jone Yuan Telephonic Enterprise Co).bin      6%      OK
Extracting /content/ROM/Chopper Command (Hack) (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Chopper Command (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Chopper Command - Captain Helicopter (1982) (Activi
sion, Bob Whitehead - Ariola) (EAX-015, EAX-015-04I - 711 015-725) (PAL).bin
6%      OK
Extracting /content/ROM/Chuck Norris Superkicks (1983) (Xonox - K-Tel Softw
are - VSS, Robert Weatherby) (6230, 06002, 06003, 99003) ~.bin      6%      OK
Extracting /content/ROM/Circus (AKA Circus Atari) (Paddle) (Zellers).bin
6%      OK
Extracting /content/ROM/Circus Atari (Paddle) (1980) (Atari, Mike Lorenzen)
(CX2630, CX2630P) (PAL).bin      6%      OK
Extracting /content/ROM/Circus Atari (Paddle) (Hack) (32 in 1) (Bit Corpora
tion) (R320).bin      6%      OK
Extracting /content/ROM/Circus Atari (Paddle) (Unknown) (PAL).bin
6%      OK
Extracting /content/ROM/Circus Atari (Paddle) (Unknown).bin
6%      OK
Extracting /content/ROM/Circus Atari - Circus (Paddle) (1980) (Atari, Mike
Lorenzen - Sears) (CX2630 - 49-75122) ~.bin      6%      OK
Extracting /content/ROM/Coco Nuts (1982) (Telesys, Jim Rupp, Jack Woodman)
(1001) ~.bin      6%      OK
Extracting /content/ROM/Codebreaker (Numbers) (Keyboard Controller) (1978)
(Atari) (CX2643) (PAL).bin      6%      OK
Extracting /content/ROM/Codebreaker - Code Breaker (Numbers) (Keyboard Cont
roller) (1978) (Atari - Sears) (CX2643 - 6-99815) ~.bin      6%      OK
Extracting /content/ROM/Color Bar Generator (1984) (Video Soft, Jerry Lawso
n, Dan McElroy) (VS1008) ~.bin      6%      OK
Extracting /content/ROM/Colors (1980) (Atari) (Prototype) (PAL) ~.bin

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0000 6%00000 OK
Extracting /content/ROM/Comando Suicida (AKA Chopper Command) (Dismac).bin
0000 6%00000 OK
Extracting /content/ROM/Combat (32 in 1) (1988) (Atari, Joe Decuir, Larry K
aplan, Steve Mayer, Larry Wagner) (CX26163P) (PAL).bin 0000 6%00000 OK
Extracting /content/ROM/Combat (Tank) (1977) (Atari, Joe Decuir, Larry Kapl
an, Steve Mayer, Larry Wagner) (CX2601, CX2601P) (PAL).bin 0000 6%00000
OK
Extracting /content/ROM/Combat - Tank-Plus (Tank) (1977) (Atari, Joe Decui
r, Larry Kaplan, Steve Mayer, Larry Wagner - Sears) (CX2601 - 99801, 6-9980
1, 49-75101, 49-75124) ~.bin 0000 6%00000 OK
Extracting /content/ROM/Combat Two (Super Combat) (1982) (Atari - GCC) (CX2
663) (Prototype) ~.bin 0000 6%00000 OK
Extracting /content/ROM/Commando (1984) (AKA Front Line) (Edu Games - Edu J
uegos) (PAL).bin 0000 6%00000 OK
Extracting /content/ROM/Commando (1988) (Activision - Imagineering, Mike Re
idel) (AK-043-04) [different logo] ~.bin 0000 6%00000 OK
Extracting /content/ROM/Commando (1988) (Activision - Imagineering, Mike Re
idel) (AK-043-04) ~.bin 0000 7%00000 OK
Extracting /content/ROM/Commando (1988) (Activision - Imagineering, Mike Re
idel) (EAK-043-04I) (PAL).bin 0000 7%00000 OK
Extracting /content/ROM/Commando Raid (1982) (U.S. Games Corporation - JWD
A, Todd Marshall, Wes Trager, Henry Will IV) (VC1004) ~.bin 0000
7%00000 OK
Extracting /content/ROM/Commando Raid (1983) (Carrere Video - JWDA, Todd Ma
rshall, Wes Trager, Henry Will IV - Teldec - Prism) (USC1004) (PAL).bin
0000 7%00000 OK
Extracting /content/ROM/Commando Raid (Unknown) (PAL) [a].bin
0000 7%00000 OK
Extracting /content/ROM/Commando Raid (Unknown) (PAL).bin
0000 7%00000 OK
Extracting /content/ROM/Communist Mutants from Space (Galactic Egg) (1982)
(Arcadia Corporation, Stephen H. Landrum) (2) (AR-4101) ~.bin 0000
7%00000 OK
Extracting /content/ROM/Communist Mutants from Space (Galactic Egg) (1982)
(Starpath Corporation, Stephen H. Landrum) (2) (AR-4101) (PAL).bin 0000
7%00000 OK
Extracting /content/ROM/Communist Mutants from Space (Galactic Egg) (Previe
w) (1982) (Arcadia Corporation, Stephen H. Landrum) (2) (AR-4101).bin
0000 7%00000 OK
Extracting /content/ROM/Communist Mutants from Space (Galactic Egg) (Previe
w) (1982) (Starpath Corporation, Stephen H. Landrum) (2) (AR-4101) (PAL).bin
0000 7%00000 OK
Extracting /content/ROM/CompuMate (1983) (Spectravideo - Universum) (SV-01
0) (PAL).bin 0000 7%00000 OK
Extracting /content/ROM/CompuMate (1983) (Spectravideo) (SV-010) ~.bin
0000 7%00000 OK
Extracting /content/ROM/Computer Chess (07-07-1978) (Atari, Larry Wagner, B
ob Whitehead) (Prototype).bin 0000 7%00000 OK
Extracting /content/ROM/Condor Attack (1982) (Ultravision) (1043) (PAL).bin
0000 7%00000 OK
Extracting /content/ROM/Condor Attack (1982) (Ultravision) (1043) ~.bin
0000 7%00000 OK
Extracting /content/ROM/Condor Attack (1983) (Goliath) (4) (PAL).bin
0000 7%00000 OK
Extracting /content/ROM/Condor Attack (Unknown) (PAL).bin

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0000 7%000000 OK
Extracting /content/ROM/Confrontation (1983) (Answer Software Corporation -
TY Associates, Kim Ellis) (ASC2001) (Prototype) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Congo Bongo (1983) (SEGA - Beck-Tech, Steve Beck, P
hat Ho - Teldec) (006-01 - 3.60105 VG) (PAL).bin 0000 7%000000 OK
Extracting /content/ROM/Congo Bongo (1983) (SEGA - Beck-Tech, Steve Beck, P
hat Ho) (006-01) [a].bin 0000 7%000000 OK
Extracting /content/ROM/Congo Bongo (1983) (SEGA - Beck-Tech, Steve Beck, P
hat Ho) (006-01) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Cookie Monster Munch (Cokie Monster's Maze, Cookie
Monster's Garden) (Kid's Controller) (1983) (Atari - CCW, Gary Stark) (CX261
02) (PAL).bin 0000 7%000000 OK
Extracting /content/ROM/Cookie Monster Munch (Cokie Monster's Maze, Cookie
Monster's Garden) (Kid's Controller) (1983) (Atari - CCW, Gary Stark) (CX261
02) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Corrida da Matemática (AKA Math Gran Prix) (CCE).bi
n 0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (1983) (CCE) (C-831) [a].bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (1983) (CCE) (C-831).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Canal 3 - Intellivision).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Dactari - Milmar).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Fotomania).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (7
20104-1A, 720104-1B, IA3204) [selectable starfield] ~.bin 0000 7%000000
OK
Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (7
20104-1A, 720104-1B, IA3204) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (7
20104-2A, IA3204P, EIX-008-04I) (PAL) [selectable starfield].bin 0000
7%000000 OK
Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (7
20104-2A, IA3204P, EIX-008-04I) (PAL).bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Ark (Unknown) (PAL).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Avenger (AKA StarMaster) (4 Game in One) (19
83) (Bit Corporation) (PGP214) (PAL).bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Commuter (1984) (Activision, John Van Ryzin)
(AG-038-04) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Commuter (CCE).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Corridor (AKA Space Tunnel) (1983) (ZiMAG -
Emag - Vidco) (708-111 - GN-040).bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Creeps (Space Maze, Spaze Maze) (1982) (Tele
sys, Don 'Donyo' Ruffcorn) (1002) (PAL).bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Creeps (Space Maze, Spaze Maze) (1982) (Tele
sys, Don 'Donyo' Ruffcorn) (1002) ~.bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Creeps (Unknown) (PAL).bin
0000 7%000000 OK
Extracting /content/ROM/Cosmic Swarm (2600 Screen Search Console) (Jone Yua
n Telephonic Enterprise Co).bin 0000 7%000000 OK
Extracting /content/ROM/Cosmic Swarm (Termite) (1982) (CommaVid, John Brons

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tein) (CM-003) (Prototype).bin      7%      OK
Extracting /content/ROM/Cosmic Swarm (Termite) (1982) (CommaVid, John Brons
tein) (CM-003) ~.bin      7%      OK
Extracting /content/ROM/Cosmic Swarm (Unknown).bin
7%      OK
Extracting /content/ROM/Cosmic Swarm - Angriff der Termiten (Termite) (198
2) (CommaVid, John Bronstein - Ariola) (CM-003 - 712 003-720) (PAL).bin
7%      OK
Extracting /content/ROM/Cosmic Town (AKA Base Attack) (Perry Rhodan-Serie)
(1983) (ITT Family Games) (554-33 375) (PAL).bin      7%      OK
Extracting /content/ROM/Cosmic War (AKA Space Tunnel) (1983) (Home Vision -
Gem International Corporation - VDI) (VCS83136) (PAL).bin      7%      OK
Extracting /content/ROM/Crack'ed (11-28-1988) (Atari - Zip Technology, Rand
y Bowker, Bruce Williams) (CX26142) (Prototype) ~.bin      7%      OK
Extracting /content/ROM/Crackpots (1983) (CCE) (C-862) [a].bin
7%      OK
Extracting /content/ROM/Crackpots (1983) (CCE) (C-862).bin
7%      OK
Extracting /content/ROM/Crackpots (2600 Screen Search Console) (Jone Yuan T
elephonic Enterprise Co).bin      7%      OK
Extracting /content/ROM/Crackpots (Digivision).bin
8%      OK
Extracting /content/ROM/Crackpots (Flower Power) (1983) (Activision, Dan Ki
tchen) (AX-029) ~.bin      8%      OK
Extracting /content/ROM/Crackpots (Fotomania).bin
8%      OK
Extracting /content/ROM/Crackpots (Unknown) (PAL).bin
8%      OK
Extracting /content/ROM/Crash Dive (Voyage to the Bottom of the Sea) (1983)
(20th Century Fox Video Games, Bill Aspromonte) (11031) ~.bin      8%      OK
Extracting /content/ROM/Crash Dive (Voyage to the Bottom of the Sea) (1983)
(20th Century Fox Video Games, Bill Aspromonte) (11131) (PAL).bin      8%      OK
Extracting /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher,
Alex Leavens) (CX2683) (Prototype) [a1].bin      8%      OK
Extracting /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher,
Alex Leavens) (CX2683) (Prototype) [a2].bin      8%      OK
Extracting /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher,
Alex Leavens) (CX2683) (Prototype) [a3].bin      8%      OK
Extracting /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher,
Alex Leavens) (CX2683) (Prototype).bin      8%      OK
Extracting /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher,
Alex Leavens) (CX2683) ~.bin      8%      OK
Extracting /content/ROM/Crazy Ski (2600 Screen Search Console) (Jone Yuan T
elephonic Enterprise Co).bin      8%      OK
Extracting /content/ROM/Criminal Pursuit (AKA A Mysterious Thief) (1983) (S
untek) (SS-036) (PAL).bin      8%      OK
Extracting /content/ROM/Criminal Pursuit (AKA A Mysterious Thief) (Video Ga
me Cartridge - Ariola) (TP-619) (PAL).bin      8%      OK
Extracting /content/ROM/Cross Force (Cross Fire) (1982) (Spectravision - Sp
ectravideo) (SA-203) ~.bin      8%      OK
Extracting /content/ROM/Cross Force (Unknown) (PAL).bin
8%      OK
Extracting /content/ROM/Cross Force - Kreuzfeuer (Cross Fire) (1982) (Spect

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ravisio - Spectravideo - Quelle) (SA-203 - 413.223 9) (PAL).bin      8% OK
Extracting /content/ROM/Crossbow (1988) (Atari - Imagineering, Dan Kitchen)
(CX26139) ~.bin      8% OK
Extracting /content/ROM/Crossbow (1988) (Atari - Imagineering, Dan Kitchen)
(CX26139P) (PAL).bin      8% OK
Extracting /content/ROM/Cruise Missile (AKA Exocet) (1987) (Froggo) (FG100
7).bin      8% OK
Extracting /content/ROM/Crypts of Chaos (1983) (20th Century Fox Video Game
s, John W.S. Marvin) (11009) ~.bin      8% OK
Extracting /content/ROM/Crystal Castles (01-04-1984) (Atari, Michael Kosak
a, Peter C. Niday, Robert Vieira) (CX26110) (Prototype).bin      8% OK
Extracting /content/ROM/Crystal Castles (1984) (Atari, Michael Kosaka, Pete
r C. Niday, Robert Vieira) (CX26110) (PAL).bin      8% OK
Extracting /content/ROM/Crystal Castles (1984) (Atari, Michael Kosaka, Pete
r C. Niday, Robert Vieira) (CX26110) ~.bin      8% OK
Extracting /content/ROM/Cubicolor (1982) (Imagic, Rob Fulop) (Prototype) ~.
bin      8% OK
Extracting /content/ROM/Cubo Mágico (AKA Cubicolor) (CCE).bin
8% OK
Extracting /content/ROM/Curtiss (AKA Atlantis) (1983) (Rainbow Vision - Sun
tek) (SS-019) (PAL).bin      8% OK
Extracting /content/ROM/Custer's Revenge (1982) (Mystique - American Multip
le Industries, Joel H. Martin) (1001) ~.bin      8% OK
Extracting /content/ROM/Custer's Revenge (1982) (Mystique - American Multip
le Industries, Joel H. Martin) (PAL).bin      8% OK
Extracting /content/ROM/Dancing Plate (1982) (Bit Corporation) (PG205).bin
8% OK
Extracting /content/ROM/Dancing Plate (1982) (Puzzy - Bit Corporation) (PG2
05) (PAL).bin      8% OK
Extracting /content/ROM/Dancing Plate (Unknown) (PAL).bin
8% OK
Extracting /content/ROM/Dancing Plate - Dancing Plates - Tanzende Teller (1
982) (Bit Corporation) (PG205) (PAL) ~.bin      8% OK
Extracting /content/ROM/Dark Cavern (1982) (M Network - APh Technological C
onsulting, Hal Finney) (MT5667) ~.bin      8% OK
Extracting /content/ROM/Dark Chambers (Dungeon, Dungeon Masters) (1988) (At
ari - Sculptured Software, Adam Clayton) (CX26151, CX26151P) (Prototype) (PA
L).bin      8% OK
Extracting /content/ROM/Dark Chambers (Dungeon, Dungeon Masters) (1989) (At
ari - Sculptured Software, Adam Clayton) (CX26151) ~.bin      8% OK
Extracting /content/ROM/Dark Chambers (Dungeon, Dungeon Masters) (1989) (At
ari - Sculptured Software, Adam Clayton) (CX26151, CX26151P) (PAL).bin
8% OK
Extracting /content/ROM/Das Raumschiff (AKA Go Go Home) (1983) (Video Game
- Ariola) (SP-211) (PAL).bin      8% OK
Extracting /content/ROM/Deadly Discs (AKA TRON - Deadly Discs) (1988) (Tele
games) (PAL).bin      8% OK
Extracting /content/ROM/Deadly Duck (1982) (20th Century Fox Video Games -
Sirius Software, Ed Hodapp) (11004) ~.bin      8% OK
Extracting /content/ROM/Death Trap (1983) (Avalon Hill, Jean Baer, Jim Jaco
b) (5001002) ~.bin      8% OK
Extracting /content/ROM/Decathlon (AKA The Activision Decathlon) (HES - Act
ivision) (PAL) (16K).bin      8% OK

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Extracting /content/ROM/Defender (10-30-1981) (Atari, Robert C. Polaro, Alan J. Murphy - Sears) (CX2609 - 49-75186) (Prototype).bin  9%  OK
Extracting /content/ROM/Defender (11-XX-1981) (Atari, Robert C. Polaro, Alan J. Murphy - Sears) (CX2609 - 49-75186) (Prototype).bin  9%  OK
Extracting /content/ROM/Defender (1982) (Atari, Robert C. Polaro, Alan J. Murphy - Sears) (CX2609 - 49-75186) ~.bin  9%  OK
Extracting /content/ROM/Defender (1982) (Atari, Robert C. Polaro, Alan J. Murphy) (CX2609, CX2609P) (PAL).bin  9%  OK
Extracting /content/ROM/Defender (CCE).bin  9%  OK
Extracting /content/ROM/Defender (Dactari - Milmar).bin  9%  OK
Extracting /content/ROM/Defender (Digivision).bin  9%  OK
Extracting /content/ROM/Defender (Hack) (32 in 1) (Bit Corporation) (R320).bin  9%  OK
Extracting /content/ROM/Defender (Hack) (Unknown).bin  9%  OK
Extracting /content/ROM/Defender (Unknown) (PAL).bin  9%  OK
Extracting /content/ROM/Defender II (AKA Stargate) (1987) (Atari, Bill Aspromonte, Andrew Fuchs) (CX26120) (PAL).bin  9%  OK
Extracting /content/ROM/Defender II (AKA Stargate) (1987) (Atari, Bill Aspromonte, Andrew Fuchs) (CX26120).bin  9%  OK
Extracting /content/ROM/Demolition Herby (1983) (Telesys, Don Ruffcorn) (1006) (PAL).bin  9%  OK
Extracting /content/ROM/Demolition Herby (1983) (Telesys, Don Ruffcorn) (1006) ~.bin  9%  OK
Extracting /content/ROM/Demolition Herby (Unknown) (PAL).bin  9%  OK
Extracting /content/ROM/Demon Attack (1983) (CCE) (C-823).bin  9%  OK
Extracting /content/ROM/Demon Attack (Canal 3 - Intellivision) (C 3016).bin  9%  OK
Extracting /content/ROM/Demon Attack (Death from Above) (1982) (Imagic, Rob Fulop) (720000-200, 720101-1B, 720101-1C, IA3200, IA3200C, IX-006-04) [fixed] ~.bin  9%  OK
Extracting /content/ROM/Demon Attack (Death from Above) (1982) (Imagic, Rob Fulop) (720000-200, 720101-1B, 720101-1C, IA3200, IA3200C, IX-006-04) ~.bin  9%  OK
Extracting /content/ROM/Demon Attack (Death from Above) (1982) (Imagic, Rob Fulop) (720101-2B, IA3200P, EIX-006-04I) (PAL).bin  9%  OK
Extracting /content/ROM/Demon Attack (Fotomania).bin  9%  OK
Extracting /content/ROM/Demon Attack (Hack) (32 in 1) (Bit Corporation) (R320).bin  9%  OK
Extracting /content/ROM/Demon Attack (Robby).bin  9%  OK
Extracting /content/ROM/Demon Attack (Supergame).bin  9%  OK
Extracting /content/ROM/Demon Attack (Unknown) (PAL).bin  9%  OK
Extracting /content/ROM/Demons to Diamonds (Hot Rox) (Paddle) (1982) (Atari, Alan J. Murphy, Nick 'Sandy Maiwald' Turner - Sears) (CX2615 - 49-75140)

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~.bin      9% OK
Extracting /content/ROM/Demons to Diamonds (Hot Rox) (Paddle) (1982) (Atari, Alan J. Murphy, Nick 'Sandy Maiwald' Turner) (CX2615) (PAL).bin      9% OK
Extracting /content/ROM/Demons to Diamonds (Paddle) (CCE).bin
9% OK
Extracting /content/ROM/Depth Charge (1983) (Amiga - Video Soft) (Prototype) ~.bin      9% OK
Extracting /content/ROM/Der flinke Architekt (AKA Master Builder) (1983) (Quelle) (343.373 7) (PAL).bin      9% OK
Extracting /content/ROM/Der Geheimkurier (AKA Mr. Postman) (1983) (Quelle) (802.744 3) (PAL).bin      9% OK
Extracting /content/ROM/Der hungrige Panda - Panda (Quest) (AKA Panda Chase) (1983) (Quelle - Otto Versand) (731.662 3 - 550425) (PAL).bin      9% OK
Extracting /content/ROM/Der kleine Baer (AKA Frostbite) (1983) (Quelle) (685.640 5) (PAL).bin      9% OK
Extracting /content/ROM/Der moderne Ritter - Mr. T (AKA Fast Eddie) (1983) (Quelle - Otto Versand) (700.223 1 - 781627) (PAL).bin      9% OK
Extracting /content/ROM/Der Vielfrass (AKA Fast Food) (1983) (Quelle) (176.543 7) (PAL).bin      9% OK
Extracting /content/ROM/Desert Falcon (Nile Flyer, Sphinx) (05-27-1987) (Atari - Bobco, Robert C. Polaro) (CX26140, CX26140P) (Prototype) (PAL).bin      9% OK
Extracting /content/ROM/Desert Falcon (Nile Flyer, Sphinx) (1987) (Atari - Bobco, Robert C. Polaro) (CX26140) ~.bin      9% OK
Extracting /content/ROM/Desert Falcon (Nile Flyer, Sphinx) (1987) (Atari - Bobco, Robert C. Polaro) (CX26140, CX26140P) (PAL).bin      9% OK
Extracting /content/ROM/Diagnostic Test Cartridge 2.0 (1980) (Atari) (50008) (Prototype) ~.bin      9% OK
Extracting /content/ROM/Diagnostic Test Cartridge 2.6 (1982) (Atari) (MA017600) ~.bin      9% OK
Extracting /content/ROM/Diagnostic Test Cartridge 2.6P (1982) (Atari) (TE016643) (PAL) (4K).bin      9% OK
Extracting /content/ROM/Diagnostic Test Cartridge 4.2 (06-01-1982) (Atari) ~.bin      9% OK
Extracting /content/ROM/Dice Puzzle (1983) (Panda) (106).bin
9% OK
Extracting /content/ROM/Dice Puzzle (1983) (Sancho - Tang's Electronic Co.) (TEC005) (PAL) ~.bin      9% OK
Extracting /content/ROM/Die Ente und der Wolf (AKA Pooyan) (1983) (Quelle) (688.383 9) (PAL).bin      9% OK
Extracting /content/ROM/Die hungrigen Froesche (AKA Frogs and Flies) (1983) (Quelle) (043.151 0, 874.382 5) (PAL).bin      9% OK
Extracting /content/ROM/Die Ratte und die Karotten (AKA Gopher) (1983) (Quelle) (687.463 0) (PAL).bin      9% OK
Extracting /content/ROM/Die Springteufel (AKA Infiltrate) (1983) (Quelle) (176.654 2) (PAL).bin      9% OK
Extracting /content/ROM/Die Unterwasser Bestien - Mariana (AKA Seaquest) (1983) (Quelle - Otto Versand) (463.734 4 - 550293) (PAL).bin      9% OK
Extracting /content/ROM/Dig Dug (1983) (Atari - GCC, Ava-Robin Cohen, Douglas B. Macrae) (CX2677) ~.bin      9% OK
Extracting /content/ROM/Dig Dug (1983) (Atari - GCC, Ava-Robin Cohen, Douglas B. Macrae) (CX2677, CX2677P) (PAL).bin      9% OK
Extracting /content/ROM/Dishaster (AKA Dancing Plate) (1983) (ZiMAG - Emag

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- Vidco) (711-111 - GN-020).bin      9%      OK
Extracting /content/ROM/Dodge 'Em (Head On) (1980) (Atari, Carla Meninsky)
(CX2637, CX2637P) (PAL) [fixed].bin      9%      OK
Extracting /content/ROM/Dodge 'Em (Head On) (1980) (Atari, Carla Meninsky)
(CX2637, CX2637P) (PAL).bin      9%      OK
Extracting /content/ROM/Dodge 'Em (Unknown) (PAL).bin
9%      OK
Extracting /content/ROM/Dodge 'Em - Dodger Cars (Head On) (1980) (Atari, Ca
rla Meninsky - Sears) (CX2637 - 49-75158) [fixed] ~.bin      10%      0
K
Extracting /content/ROM/Dodge 'Em - Dodger Cars (Head On) (1980) (Atari, Ca
rla Meninsky - Sears) (CX2637 - 49-75158) ~.bin      10%      OK
Extracting /content/ROM/Dolphin (1983) (Activision, Matthew L. Hubbard, Bob
Whitehead) (AX-024) ~.bin      10%      OK
Extracting /content/ROM/Dolphin (CCE).bin
10%      OK
Extracting /content/ROM/Donald Duck's Speedboat (Donald Duck's Sailboat Reg
atta) (04-12-1983) (Atari, Dave Joly, Suki Lee) (CX26108) (Prototype) ~.bin
10%      OK
Extracting /content/ROM/Donald Duck's Speedboat (Donald Duck's Sailboat Reg
atta) (04-18-1983) (Atari, Dave Joly, Suki Lee) (CX26108) (Prototype) (PAL).
bin      10%      OK
Extracting /content/ROM/Donkey Kong (1982) (Coleco - Woodside Design Associ
ates - Imaginative Systems Software, Garry Kitchen) (2451) ~.bin      1
0%      OK
Extracting /content/ROM/Donkey Kong (1983) (CBS Electronics - Woodside Desi
gn Associates - Imaginative Systems Software, Garry Kitchen) (4L1700, 4L170
1, 4L1702, 4L1802, 4L2274) (PAL).bin      10%      OK
Extracting /content/ROM/Donkey Kong (1987) (Atari) (CX26143).bin
10%      OK
Extracting /content/ROM/Donkey Kong (Hack) (32 in 1) (Bit Corporation) (R32
0).bin      10%      OK
Extracting /content/ROM/Donkey Kong (Hack) (Unknown).bin
10%      OK
Extracting /content/ROM/Donkey Kong (Unknown) (PAL).bin
10%      OK
Extracting /content/ROM/Donkey Kong Jr (AKA Donkey Kong Junior) (1983) (CC
E) (C-1003).bin      10%      OK
Extracting /content/ROM/Donkey Kong Jr. (AKA Donkey Kong Junior) (Tron).bin
10%      OK
Extracting /content/ROM/Donkey Kong Junior (1983) (CBS Electronics - Woodsi
de Design Associates, Harley H. Puthuff Jr.) (4L1802) (PAL).bin      1
0%      OK
Extracting /content/ROM/Donkey Kong Junior (1983) (Coleco - Woodside Design
Associates, Harley H. Puthuff Jr.) (2653) ~.bin      10%      OK
Extracting /content/ROM/Donkey Kong Junior (1987) (Atari) (CX26144).bin
10%      OK
Extracting /content/ROM/Double Dragon (1989) (Activision - Imagineering, Do
nald Hahn, Dan Kitchen) (AK-050-04) ~.bin      10%      OK
Extracting /content/ROM/Double Dragon (1989) (Activision - Imagineering, Do
nald Hahn, Dan Kitchen) (EAK-050-04) (PAL).bin      10%      OK
Extracting /content/ROM/Double Dragon (CCE) (PAL).bin
10%      OK
Extracting /content/ROM/Double Dunk (Super Basketball) (1989) (Atari, Matth
ew L. Hubbard) (CX26159) (PAL).bin      10%      OK
Extracting /content/ROM/Double Dunk (Super Basketball) (1989) (Atari, Matth

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ew L. Hubbard) (CX26159) ~.bin      100%  OK
Extracting /content/ROM/Dragon Defender (AKA Dragon Power) (1983) (Suntek)
(SS-021) (PAL).bin      100%  OK
Extracting /content/ROM/Dragon Defender (AKA Dragon Power) (Video Game Cart
ridge - Ariola) (TP-605) (PAL).bin    100%  OK
Extracting /content/ROM/Dragon Treasure (AKA Dragonfire) (Zellers).bin
100%  OK
Extracting /content/ROM/Dragonfire (Cheese) (1982) (Imagic, Bob Smith) (720
020-1A, IA3611, IA3611C) ~.bin      100%  OK
Extracting /content/ROM/Dragonfire (Cheese) (1982) (Imagic, Bob Smith) (720
020-2A, IA3611P) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonfire (Unknown) (PAL).bin
100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (1 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (1 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (1982) (Starpath Corporat
ion, Stephen H. Landrum) (6) (AR-4400) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (1982) (Starpath Corporat
ion, Stephen H. Landrum) (6) (AR-4400) ~.bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (2 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (2 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (3 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (3 of 3) (1982) (Starpath
Corporation, Stephen H. Landrum) (6) (AR-4400).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (Preview) (1982) (Starpat
h Corporation, Stephen H. Landrum) (6) (AR-4400) (PAL).bin    100%  OK
Extracting /content/ROM/Dragonstomper (Excalibur) (Preview) (1982) (Starpat
h Corporation, Stephen H. Landrum) (6) (AR-4400).bin    100%  OK
Extracting /content/ROM/Dragster (2600 Screen Search Console) (Jone Yuan Te
lephonic Enterprise Co).bin    100%  OK
Extracting /content/ROM/Dragster (Drag Strip) (1980) (Activision, David Cra
ne) (AG-001) ~.bin    100%  OK
Extracting /content/ROM/Dragster - Dragster Rennen (Drag Strip) (1980) (Act
ivision, David Crane - Ariola) (EAG-001, PAG-001, EAG-001-04B, EAG-001-04I -
711 001-715) (PAL).bin    100%  OK
Extracting /content/ROM/Dream Flight (AKA Nightmare) (1983) (Goliath - Hot
Shot) (83-215) (PAL).bin    100%  OK
Extracting /content/ROM/Dschungel Boy (AKA Pitfall!) (1983) (Quelle) (262.8
94 9) (PAL).bin    11%  OK
Extracting /content/ROM/Dukes of Hazzard (1983) (Atari, Mark R. Hahn) (CX26
78) ~.bin    11%  OK
Extracting /content/ROM/Dukes of Hazzard (AKA Stunt Cycle) (Paddle) (1980)
(ATari, Robert C. Polaro) (Prototype).bin    11%  OK
Extracting /content/ROM/Dumbo's Flying Circus (Dumbo Flies Home) (04-04-198
3) (Atari, Jerome Domurat, Peter C. Niday) (CX26115) (Prototype).bin
11%  OK
Extracting /content/ROM/Dumbo's Flying Circus (Dumbo Flies Home) (05-05-198

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3) (Atari, Jerome Domurat, Peter C. Niday) (CX26115) (Prototype) ~.bin
████ 11%████ OK
Extracting /content/ROM/Dumbo's Flying Circus (Dumbo Flies Home) (07-11-198
3) (Atari, Jerome Domurat, Peter C. Niday) (CX26115) (Prototype) (PAL).bin
████ 11%████ OK
Extracting /content/ROM/Dumbo's Flying Circus (Dumbo Flies Home) (1983) (At
ari, Jerome Domurat, Peter C. Niday) (CX26115) (Prototype) (PAL).bin
████ 11%████ OK
Extracting /content/ROM/Dune (07-10-1984) (Atari, Bruce Poehlman, Gary Star
k) (Prototype) ~.bin █████ 11%████ OK
Extracting /content/ROM/Dungeon (Dark Chambers Beta) (11-22-1985) (Atari -
Sculptured Software, Adam Clayton) (CX26151, CX26151P) (Prototype).bin
████ 11%████ OK
Extracting /content/ROM/E.T. - The Extra-Terrestrial (1982) (Atari, Jerome
Domurat, Howard Scott Warshaw) (CX2674) (PAL).bin █████ 11%████ OK
Extracting /content/ROM/E.T. - The Extra-Terrestrial (1982) (Atari, Jerome
Domurat, Howard Scott Warshaw) (CX2674) ~.bin █████ 11%████ OK
Extracting /content/ROM/E.T. - The Extra-Terrestrial (CCE).bin
████ 11%████ OK
Extracting /content/ROM/Earth Attack (AKA Defender) (Zellers).bin
████ 11%████ OK
Extracting /content/ROM/Earth Dies Screaming, The (The Day the Earth Stood
Still) (1983) (20th Century Fox Video Games - Sirius Software, Dan Thompson)
(11020) ~.bin █████ 11%████ OK
Extracting /content/ROM/Earth Dies Screaming, The (Unknown) (PAL).bin
████ 11%████ OK
Extracting /content/ROM/Eddy Langfinger, der Museumsdieb (AKA A Mysterious
Thief) (1983) (Quelle) (732.052 6) (PAL).bin █████ 11%████ OK
Extracting /content/ROM/Eggomania (Canal 3 - Intellivision).bin
████ 11%████ OK
Extracting /content/ROM/Eggomania (Weird Bird) (Paddle) (1982) (U.S. Games
Corporation - JWDA, Todd Marshall, Robin McDaniel, Wes Trager, Henry Will I
V) (VC2003) ~.bin █████ 11%████ OK
Extracting /content/ROM/Eggomania - Eierregen (Paddle) (1983) (Carrere Vide
o - JWDA, Todd Marshall, Robin McDaniel, Wes Trager, Henry Will IV - Teldec
- Prism) (USC2003) (PAL).bin █████ 11%████ OK
Extracting /content/ROM/Eishockey-Fieber (AKA Ice Hockey) (1983) (Quelle)
(873.790 0) (PAL).bin █████ 11%████ OK
Extracting /content/ROM/Elevator Action (1983) (Atari, Dan Hitchens) (CX261
26) (Prototype) ~.bin █████ 11%████ OK
Extracting /content/ROM/Elf Adventure (04-22-83) (Atari, Warren Robinett)
(Prototype).bin █████ 11%████ OK
Extracting /content/ROM/Elf Adventure (05-02-83) (Atari, Warren Robinett)
(Prototype).bin █████ 11%████ OK
Extracting /content/ROM/Elf Adventure (05-25-83) (Atari, Warren Robinett)
(Prototype) ~.bin █████ 11%████ OK
Extracting /content/ROM/Eli's Ladder (1984) (Simage) ~.bin
████ 11%████ OK
Extracting /content/ROM/Elk Attack (1987) (Atari, Mark R. Hahn) (Prototype)
~.bin █████ 11%████ OK
Extracting /content/ROM/Encounter at L-5 (Megalon Invasion) (Paddle) (1982)
(Data Age) (DA1001) ~.bin █████ 11%████ OK
Extracting /content/ROM/Encounter at L-5 (Megalon Invasion) (Paddle) (1983)
(Gameworld) (133-001) (PAL).bin █████ 11%████ OK
Extracting /content/ROM/End of the World, The (2600 Screen Search Console)
(Jone Yuan Telephonic Enterprise Co).bin █████ 11%████ OK

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Extracting /content/ROM/Enduro (1983) (Activision, Larry Miller) (AX-026, A
X-026-04) ~.bin      11%  OK
Extracting /content/ROM/Enduro (1983) (CCE) (C-810).bin
11%  OK
Extracting /content/ROM/Enduro (1983) (Dactari - Milmar).bin
11%  OK
Extracting /content/ROM/Enduro (1983) (Digitel).bin
11%  OK
Extracting /content/ROM/Enduro (1983) (Dynacom).bin
11%  OK
Extracting /content/ROM/Enduro (1984) (Supergame).bin
11%  OK
Extracting /content/ROM/Enduro (Canal 3 - Intellivision).bin
11%  OK
Extracting /content/ROM/Enduro (Digivision).bin
11%  OK
Extracting /content/ROM/Enduro (Fotomania).bin
11%  OK
Extracting /content/ROM/Enduro (Robby).bin
11%  OK
Extracting /content/ROM/Enduro (Tron).bin
11%  OK
Extracting /content/ROM/Enduro (Unknown) (PAL).bin
11%  OK
Extracting /content/ROM/Enduro (Unknown) [a].bin
11%  OK
Extracting /content/ROM/Enduro (Unknown).bin
11%  OK
Extracting /content/ROM/Enduro - Transamerika-Rennen (1983) (Activision, La
rry Miller - Ariola) (EAX-026, EAX-026-04B, EAX-026-04I - 711 026-725) (PA
L).bin      11%  OK
Extracting /content/ROM/Entity, The (1983) (20th Century Fox Video Games, M
ark Klein) (11036) (Prototype) ~.bin      11%  OK
Extracting /content/ROM/Entombed (Maze Chase, Pharaoh's Tomb, Zombie) (198
3) (U.S. Games Corporation - Western Technologies, Jeff Corsiglia, Paul Alle
n Newell, Steven B. Sidley, Tom Sloper) (VC2007) ~.bin      11%  OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (1 of 4) (19
82) (Starpath Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin      11%  OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (1 of 4) (19
82) (Starpath Corporation, Dennis Caswell) (5) (AR-4200).bin      1
1%  OK
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path Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin      11%  OK
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path Corporation, Dennis Caswell) (5) (AR-4200) ~.bin      11%  OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (2 of 4) (19
82) (Starpath Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin      12%  OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (2 of 4) (19
82) (Starpath Corporation, Dennis Caswell) (5) (AR-4200).bin      1
2%  OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (3 of 4) (19
82) (Starpath Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin      12%  OK

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Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (3 of 4) (19
82) (Starpeth Corporation, Dennis Caswell) (5) (AR-4200).bin      0000 1
2%000000 OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (4 of 4) (19
82) (Starpeth Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin  0000
12%000000 OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (4 of 4) (19
82) (Starpeth Corporation, Dennis Caswell) (5) (AR-4200).bin      0000 1
2%000000 OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (Preview) (1
982) (Starpeth Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin  0000
12%000000 OK
Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (Preview) (1
982) (Starpeth Corporation, Dennis Caswell) (5) (AR-4200).bin      0000 1
2%000000 OK
Extracting /content/ROM/Eskimo Jump (AKA Frostbite) (4 Game in One) (1983)
(Bit Corporation) (CP405) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Espial (1984) (Tigervision - Teldec) (7-012 - 3.600
16 VC) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Espial (1984) (Tigervision) (7-012) ~.bin
0000 12%000000 OK
Extracting /content/ROM/Euro Gen (02-01-83) (JWDA, Todd Marshall) (PAL) ~.b
in      0000 12%000000 OK
Extracting /content/ROM/Excalibur (Dragonstomper Beta) (1982) (Arcadia Corp
oration, Stephen H. Landrum) (6) (AR-4400) (Prototype) [a].bin      0000 1
2%000000 OK
Extracting /content/ROM/Excalibur (Dragonstomper Beta) (1982) (Arcadia Corp
oration, Stephen H. Landrum) (6) (AR-4400) (Prototype).bin      0000 12%000000
OK
Extracting /content/ROM/Excalibur Version 36 (Dragonstomper Beta) (1982) (A
rcadia Corporation, Stephen H. Landrum) (6) (AR-4400) (Prototype).bin
0000 12%000000 OK
Extracting /content/ROM/Excalibur Version 39 (Dragonstomper Beta) (1982) (A
rcadia Corporation, Stephen H. Landrum) (6) (AR-4400) (Prototype).bin
0000 12%000000 OK
Extracting /content/ROM/Exocet (1982) (Sancho - Tang's Electronic Co.) (TEC
001) (PAL) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Exocet (1983) (Panda) (109).bin
0000 12%000000 OK
Extracting /content/ROM/Exocet (Unknown) (PAL).bin
0000 12%000000 OK
Extracting /content/ROM/Exoset Missile (AKA Exocet) (1982) (John Sands Elec
tronics) (JS145B) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Extra Terrestrials (1984) (Skill Screen Games, Herm
an Quast) ~.bin      0000 12%000000 OK
Extracting /content/ROM/F-14 Tomcat (1988) (Absolute Entertainment, Dan Kit
chen) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Fantastic Voyage (11-04-1982) (20th Century Fox Vid
eo Games - Sirius Software, David Lubar) (11008) (Prototype).bin      0000 1
2%000000 OK
Extracting /content/ROM/Fantastic Voyage (1982) (20th Century Fox Video Gam
es - Sirius Software, David Lubar) (11008) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Fantastic Voyage (Unknown) (PAL).bin
0000 12%000000 OK
Extracting /content/ROM/Farmer Dan (AKA Gopher) (Zellers).bin
0000 12%000000 OK

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Extracting /content/ROM/Farmyard Fun (AKA Pumuckl at the Farm House) (1983)
(Suntek) (SS-034) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Farmyard Fun (AKA Pumuckl at the Farm House) (Video
Game Cartridge - Ariola) (TP-617).bin      0000 12%000000 OK
Extracting /content/ROM/Fast Eddie (1982) (20th Century Fox Video Games - S
irius Software, Mark Turmell) (11003) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Fast Eddie (1983) (CCE) (C-834).bin
0000 12%000000 OK
Extracting /content/ROM/Fast Eddie (Hack) (32 in 1) (Bit Corporation) (R32
0).bin      0000 12%000000 OK
Extracting /content/ROM/Fast Food (1982) (Telesys, Don Ruffcorn, Jack Woodm
an) (1003) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Fast Food (1982) (Telesys, Don Ruffcorn, Jack Woodm
an) (1003) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Fast Food (Fotomania).bin
0000 12%000000 OK
Extracting /content/ROM/Fast Food (Unknown) (PAL).bin
0000 12%000000 OK
Extracting /content/ROM/Fast Food (Zirok).bin
0000 12%000000 OK
Extracting /content/ROM/Fatal Run (Ultimate Driving) (1989) (Atari - Sculpt
ured Software, Steve Aguirre) (CX26162) (Prototype).bin      0000 12%000000 0
K
Extracting /content/ROM/Fatal Run (Ultimate Driving) (1991) (Atari - Sculpt
ured Software, Steve Aguirre) (CX26162) (PAL) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Fathom (Scuba) (1983) (Imagic, Wilfredo Aguilar, Mi
chael Becker, Rob Fulop) (720111-1A, 03205) ~.bin      0000 12%000000 OK
Extracting /content/ROM/Fathom (Scuba) (1983) (Imagic, Wilfredo Aguilar, Mi
chael Becker, Rob Fulop) (720111-2A, 13205) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Fathon (AKA Fathom) (Digivision).bin
0000 12%000000 OK
Extracting /content/ROM/Felix Return (AKA Bobby Is Going Home) (1983) (Goli
ath - Hot Shot) (83-116) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Festival (AKA Carnival) (4 Game in One) (1983) (Bit
Corporation) (PGP230) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Feuerwehr im Einsatz (AKA Fire Fighter) (1983) (Que
lle) (343.173 1) (PAL).bin      0000 12%000000 OK
Extracting /content/ROM/Fighter Pilot (AKA Tomcat - The F-14 Fighter Simula
tor) (1988) (Activision, Dan Kitchen) (EAK-046-04B) (PAL).bin      0000 1
2%000000 OK
Extracting /content/ROM/Final Approach (1982) (Apollo) (AP-2009) ~.bin
0000 12%000000 OK
Extracting /content/ROM/Fire Bird (AKA Phoenix) (Video Game Program) (PAL).
bin      0000 13%000000 OK
Extracting /content/ROM/Fire Birds (AKA Sky Alien) (Perry Rhodan-Serie) (19
83) (ITT Family Games) (554-33 383) (PAL).bin      0000 13%000000 OK
Extracting /content/ROM/Fire Fighter (Fire Fighters) (1982) (Imagic, Brad S
tewart) (720105-1A, IA3400) ~.bin      0000 13%000000 OK
Extracting /content/ROM/Fire Fighter (Fire Fighters) (1982) (Imagic, Brad S
tewart) (720105-2A, IA3400P, EIX-005-04I) (PAL).bin      0000 13%000000 OK
Extracting /content/ROM/Fire Fly (1983) (Mythicon, Bill Bryner, Bruce de Gr
aaf) (MA1002) ~.bin      0000 13%000000 OK
Extracting /content/ROM/Fireball (Frantic) (Paddle) (1982) (Arcadia Corpora
tion, Scott Nelson) (3) (AR-4300) (Prototype).bin      0000 13%000000 OK
Extracting /content/ROM/Fireball (Frantic) (Paddle) (1982) (Arcadia Corpora
tion, Scott Nelson) (3) (AR-4300) ~.bin      0000 13%000000 OK

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Extracting /content/ROM/Fireball (Frantic) (Paddle) (1982) (Starpath Corporation, Scott Nelson) (3) (AR-4300) (PAL).bin 13% OK
 Extracting /content/ROM/Fireball (Frantic) (Preview) (1982) (Arcadia Corporation, Scott Nelson) (3) (AR-4300).bin 13% OK
 Extracting /content/ROM/Fireball (Frantic) (Preview) (1982) (Starpath Corporation, Scott Nelson) (3) (AR-4300) (PAL).bin 13% OK
 Extracting /content/ROM/Firebug (AKA Spinning Fireball) (1983) (Suntek) (SS-028) (PAL).bin 13% OK
 Extracting /content/ROM/Firefox (Combat II, Fighter Command) (06-01-83) (Atari - Roklan, Bob Curtiss) (Prototype) ~.bin 13% OK
 Extracting /content/ROM/Firefox (Combat II, Fighter Command) (1983) (Atari - Roklan, Bob Curtiss) (Prototype) [a].bin 13% OK
 Extracting /content/ROM/Firefox (Combat II, Fighter Command) (1983) (Atari - Roklan, Bob Curtiss) (Prototype).bin 13% OK
 Extracting /content/ROM/Fisher Price (AKA Skindiver) (1983) (CCE) (C-863).bin 13% OK
 Extracting /content/ROM/Fishing (AKA Fishing Derby) (32 in 1) (1988) (Atari) (CX26163P) (PAL).bin 13% OK
 Extracting /content/ROM/Fishing Derby (1980) (Activision, David Crane) (AG-004) ~.bin 13% OK
 Extracting /content/ROM/Fishing Derby (32 in 1) (1988) (Atari) (CX26163P) (PAL).bin 13% OK
 Extracting /content/ROM/Fishing Derby (Canal 3 - Intellivision) (4K).bin 13% OK
 Extracting /content/ROM/Fishing Derby (CCE).bin 13% OK
 Extracting /content/ROM/Fishing Derby (Hack) (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin 13% OK
 Extracting /content/ROM/Fishing Derby (Hack) (32 in 1) (Bit Corporation) (R320).bin 13% OK
 Extracting /content/ROM/Fishing Derby (Hack) (Unknown) (PAL).bin 13% OK
 Extracting /content/ROM/Fishing Derby - Schneller als der Hai (1980) (Activision, David Crane - Ariola) (EAG-004, PAG-004 - 711 004-715) (PAL).bin 13% OK
 Extracting /content/ROM/Flag Capture (32 in 1) (1988) (Atari, Jim Huether) (CX26163P) (PAL).bin 13% OK
 Extracting /content/ROM/Flag Capture (Unknown) (PAL).bin 13% OK
 Extracting /content/ROM/Flag Capture - Capture (Capture the Flag) (1978) (Atari, Jim Huether - Sears) (CX2644 - 6-99824) ~.bin 13% OK
 Extracting /content/ROM/Flash Gordon (1983) (20th Century Fox Video Games - Sirius Software, David Lubar) (11015) ~.bin 13% OK
 Extracting /content/ROM/Flash Gordon (Hack) (32 in 1) (Bit Corporation) (R320).bin 13% OK
 Extracting /content/ROM/Flash Gordon (Unknown) (PAL).bin 13% OK
 Extracting /content/ROM/Flippern (AKA Video Pinball) (Double-Game Package) (1983) (Otto Versand) (781698) (PAL).bin 13% OK
 Extracting /content/ROM/Football (1979) (Atari, Bob Whitehead - Sears) (CX2625 - 6-99827, 49-75114) ~.bin 13% OK
 Extracting /content/ROM/Football (AKA Super Challenge Football) (1988) (Tellegames) (5658 A088) (PAL).bin 13% OK
 Extracting /content/ROM/Football (AKA Super Challenge Football) (1988) (Tellegames) (5658 A088).bin 13% OK
 Extracting /content/ROM/Football (Unknown) (PAL) (4K).bin

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0000 13%000000 OK
Extracting /content/ROM/Football (Unknown) (PAL).bin
0000 13%000000 OK
Extracting /content/ROM/Football Demo (1982) (Atari, Robert Zdybel) ~.bin
0000 13%000000 OK
Extracting /content/ROM/Forest (1983) (Sancho - Tang's Electronic Co.) (TEC
006) (PAL) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Fox & Goat (AKA Nuts) (Double-Game Package) (1983)
(Otto Versand) (311377) (PAL).bin 0000 13%000000 OK
Extracting /content/ROM/Frankenstein's Monster (1982) (Data Age, J. Ray Det
tling) (112-008) (Prototype).bin 0000 13%000000 OK
Extracting /content/ROM/Frankenstein's Monster (1983) (Data Age, J. Ray Det
tling) (112-008) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Frankenstein's Monster (1983) (Gameworld, J. Ray De
ttling) (133-008) (PAL).bin 0000 13%000000 OK
Extracting /content/ROM/Freeway (1981) (Activision, David Crane) (AG-009, A
G-009-04) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Freeway (Canal 3 - Intellivision) (4K).bin
0000 13%000000 OK
Extracting /content/ROM/Freeway (CCE).bin
0000 13%000000 OK
Extracting /content/ROM/Freeway (Dactari - Milmar).bin
0000 13%000000 OK
Extracting /content/ROM/Freeway (Hack) (Unknown) (PAL).bin
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Extracting /content/ROM/Freeway (Zellers).bin
0000 13%000000 OK
Extracting /content/ROM/Freeway - Das verrueckte Huhn (1981) (Activision, D
avid Crane - Ariola) (EAG-009, PAG-009 - 711 009-720) (PAL).bin 0000 1
3%000000 OK
Extracting /content/ROM/Freeway Chicken (AKA Freeway) (32 in 1) (1988) (Ata
ri) (CX26163P) (PAL).bin 0000 13%000000 OK
Extracting /content/ROM/Freeway Rabbit (AKA Freeway) (32 in 1) (1988) (Atar
i) (CX26163P) (PAL).bin 0000 13%000000 OK
Extracting /content/ROM/Frisco (1983) (Home Vision, R.J.P.G. - Gem Internat
ional Corporation - VDI) (VCS83104) (PAL) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Frisco (Hack) (Unknown) (PAL).bin
0000 13%000000 OK
Extracting /content/ROM/Frisco (Unknown).bin
0000 13%000000 OK
Extracting /content/ROM/Frog Demo (1983) (CommaVid, Joseph Biel) (PAL) ~.bi
n 0000 13%000000 OK
Extracting /content/ROM/Frog Pond (08-27-1982) (Atari, Nick 'Sandy Maiwald'
Turner) (CX2665) (Prototype) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Frog Pond (1982) (Atari, Nick 'Sandy Maiwald' Turne
r) (CX2665) (Prototype) (4K) [a].bin 0000 13%000000 OK
Extracting /content/ROM/Frog Pond (1982) (Atari, Nick 'Sandy Maiwald' Turne
r) (CX2665) (Prototype) (4K).bin 0000 13%000000 OK
Extracting /content/ROM/Frog Pond (1982) (Atari, Nick 'Sandy Maiwald' Turne
r) (CX2665) (Prototype).bin 0000 13%000000 OK
Extracting /content/ROM/Frogger (1982) (Parker Brothers, Ed English, David
Lamkins) (931502) (PAL).bin 0000 13%000000 OK
Extracting /content/ROM/Frogger (1982) (Parker Brothers, Ed English, David
Lamkins) (PB5300) ~.bin 0000 13%000000 OK
Extracting /content/ROM/Frogger II - Threedeeep! (1984) (Parker Brothers, M
ark Lesser) (PB5590) (PAL).bin 0000 13%000000 OK

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Extracting /content/ROM/Frogger II - Threedeep! (1984) (Parker Brothers, M
ark Lesser) (PB5590) ~.bin      13%      OK
Extracting /content/ROM/Frogs and Flies (1988) (Telegames) (PAL).bin
13%      OK
Extracting /content/ROM/Frogs and Flies (Hack) (2600 Screen Search Console)
(Jone Yuan Telephonic Enterprise Co).bin      13%      OK
Extracting /content/ROM/Frogs and Flies - Frogs 'n' Flies (1982) (M Network
- INTV - Aph Technological Consulting, David Rolfe) (MT5664) ~.bin      13%      OK
Extracting /content/ROM/Front Line (1984) (Coleco - Individeo, Ed Temple)
(2665) ~.bin      13%      OK
Extracting /content/ROM/Frontline (AKA Combat) (Zellers).bin
13%      OK
Extracting /content/ROM/Frostbite (1983) (Digitel).bin
13%      OK
Extracting /content/ROM/Frostbite (1983) (Video Mania).bin
13%      OK
Extracting /content/ROM/Frostbite (CCE).bin
13%      OK
Extracting /content/ROM/Frostbite (Digivision).bin
14%      OK
Extracting /content/ROM/Frostbite (Fotomania).bin
14%      OK
Extracting /content/ROM/Frostbite (Iceman) (1983) (Activision, Steve Cartwr
ight) (AX-031) ~.bin      14%      OK
Extracting /content/ROM/Frostbite - Expedition ins Eis (Iceman) (1983) (Act
ivision, Steve Cartwright - Ariola) (EAX-031, EAX-031-04B - 711 031-717) (PA
L).bin      14%      OK
Extracting /content/ROM/Fuchs & Schweinchen Schlau (AKA Oink!) (1983) (Quel
le) (806.174 9) (PAL).bin      14%      OK
Extracting /content/ROM/Fun with Numbers (32 in 1) (1988) (Atari, Gary Palm
er) (CX26163P) (PAL).bin      14%      OK
Extracting /content/ROM/Fun with Numbers (AKA Basic Math) (1980) (Atari, Ga
ry Palmer) (CX2661).bin      14%      OK
Extracting /content/ROM/Fun with Numbers (AKA Basic Math) (1980) (Atari, Ga
ry Palmer) (CX2661P) (PAL).bin      14%      OK
Extracting /content/ROM/Funky Fish (1983) (UA Limited) (Prototype) ~.bin
14%      OK
Extracting /content/ROM/Fussball (AKA International Soccer) (Videospielkass
ette - Ariola) (PGP235) (PAL).bin      14%      OK
Extracting /content/ROM/G.I. Joe - Cobra Strike (Paddle) (1983) (Parker Bro
thers, John Emerson) (PB5920) ~.bin      14%      OK
Extracting /content/ROM/Galactic (AKA Condor Attack) (1983) (Goliath - Hot
Shot) (83-416) (PAL).bin      14%      OK
Extracting /content/ROM/Galactic (AKA Condor Attack) (Funvision - Fund. Int
ernational Co.) (PAL).bin      14%      OK
Extracting /content/ROM/Galactic (AKA The Challenge of.... Nexar) (1983) (Q
uelle) (218.202 0) (PAL).bin      14%      OK
Extracting /content/ROM/Galactic (AKA The Challenge of.... Nexar) (1983) (R
ainbow Vision - Suntek) (SS-002) (PAL) [a].bin      14%      OK
Extracting /content/ROM/Galactic (AKA The Challenge of.... Nexar) (1983) (R
ainbow Vision - Suntek) (SS-002) (PAL).bin      14%      OK
Extracting /content/ROM/Galatic (AKA The Challenge of.... Nexar) (Unknown)
(PAL).bin      14%      OK
Extracting /content/ROM/Galaxian (01-05-1983) (Atari - GCC, Mark Ackerman,
Tom Calderwood, Glenn Parker) (CX2684) (Prototype).bin      14%      OK

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Extracting /content/ROM/Galaxian (02-04-1983) (Atari - GCC, Mark Ackerman,
Tom Calderwood, Glenn Parker) (CX2684) (Prototype).bin      14%  OK
Extracting /content/ROM/Galaxian (1983) (Atari - GCC, Mark Ackerman, Tom Ca
lderwood, Glenn Parker) (CX2684) ~.bin      14%  OK
Extracting /content/ROM/Galaxian (1983) (Atari - GCC, Mark Ackerman, Tom Ca
lderwood, Glenn Parker) (CX2684, CX2684P) (PAL).bin      14%  OK
Extracting /content/ROM/Galaxian (CCE).bin
14%  OK
Extracting /content/ROM/Galaxian (Digivision).bin
14%  OK
Extracting /content/ROM/Galaxian (Edu Games - Edu Juegos) (PAL).bin
14%  OK
Extracting /content/ROM/Game of Concentration, A (AKA Hunt & Score) (Keyboa
rd Controller) (1980) (Atari, Alan Miller) (CX2642P) (PAL).bin      1
4%  OK
Extracting /content/ROM/Game of Concentration, A - Concentration (AKA Hunt
& Score) (Keyboard Controller) (1980) (Atari, Alan Miller) (CX2642).bin
14%  OK
Extracting /content/ROM/GameLine Master Module ROM (1983) (Control Video Co
rporation) ~.bin      14%  OK
Extracting /content/ROM/Gamma-Attack (1983) (Gammation, Robert L. Esken J
r.) ~.bin      14%  OK
Extracting /content/ROM/Gangster (AKA Outlaw) (Videospielkassette - Ariola)
(PGP238) (PAL).bin      14%  OK
Extracting /content/ROM/Gangster Alley (1982) (Spectravision - Spectravide
o) (SA-201) [fixed] ~.bin      14%  OK
Extracting /content/ROM/Gangster Alley (1982) (Spectravision - Spectravide
o) (SA-201) ~.bin      14%  OK
Extracting /content/ROM/Gangster Alley - Gangster Ruine (1982) (Spectravis
ion - Spectravideo - Quelle) (SA-201 - 412.783 3) (PAL).bin      14%  OK
Extracting /content/ROM/Garfield (Garfield on the Run) (06-21-1984) (Atari,
Mimi Nyden, Steve Woita) (CX26132) (Prototype) ~.bin      14%  OK
Extracting /content/ROM/Gas Hog (1983) (Spectravideo, Mark Turmell) (SA-21
7) [fixed] ~.bin      14%  OK
Extracting /content/ROM/Gas Hog (1983) (Spectravideo, Mark Turmell) (SA-21
7) ~.bin      14%  OK
Extracting /content/ROM/Gas Hog (Unknown).bin
14%  OK
Extracting /content/ROM/Gas Hog - Piraten Schiff (1983) (Spectravideo, Mark
Turmell - Quelle) (SA-217, SA-217C - 413.723 8) (PAL).bin      14%  OK
Extracting /content/ROM/Gauntlet (1983) (Answer Software Corporation - TY A
ssociates, Mike Wentz) (ASC1002) ~.bin      14%  OK
Extracting /content/ROM/Gefaehrliche Maeusejagd (AKA Topy) (1983) (Quelle)
(719.551 4) (PAL).bin      14%  OK
Extracting /content/ROM/Gefecht im All (AKA Space Jockey) (1983) (Quelle)
(147.443 6) (PAL).bin      14%  OK
Extracting /content/ROM/General Re-Treat (AKA Custer's Revenge) (1982) (Pla
yAround - JHM) (206) (PAL).bin      14%  OK
Extracting /content/ROM/Ghost Manor (1983) (Xonox - K-Tel Software - Beck-T
ech, Steve Beck) (6210, 06002, 06004, 99002) (PAL).bin      14%  OK
Extracting /content/ROM/Ghost Manor (1983) (Xonox - K-Tel Software - Beck-T
ech, Steve Beck) (6210, 06002, 06004, 99002) ~.bin      14%  OK
Extracting /content/ROM/Ghostbusters (1985) (Activision, David Crane, Dan K
itchen) (AZ-108-04) ~.bin      14%  OK

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Extracting /content/ROM/Ghostbusters (1985) (Activision, David Crane, Dan K
itchen) (EAG-108-04, EAZ-108-04B) (PAL).bin 14% OK

Extracting /content/ROM/Ghostbusters II (1992) (Salu - Avantgarde Software,
Michael Buetepage) (460741) (PAL) [different tune] ~.bin 14% OK

Extracting /content/ROM/Ghostbusters II (1992) (Salu - Avantgarde Software,
Michael Buetepage) (460741) (PAL) ~.bin 14% OK

Extracting /content/ROM/Gigolo (1982) (PlayAround - JHM) (205).bin
14% OK

Extracting /content/ROM/Glacier Patrol (1988) (Telegames - VSS, Ed Salvo)
(5665 A016) (PAL).bin 14% OK

Extracting /content/ROM/Glacier Patrol (1988) (Telegames - VSS, Ed Salvo)
(5667 A106) ~.bin 14% OK

Extracting /content/ROM/Glib - Video Word Game (Head of the Class) (1983)
(QDI, Mike Montana, Rich Montana - Selchow & Righter) (87) ~.bin 1
4% OK

Extracting /content/ROM/Go Go Home (Unknown).bin
14% OK

Extracting /content/ROM/Go Go Home Monster (AKA Go Go Home) (1983) (Home Vi
sion - Gem International Corporation - VDI) (PAL).bin 14% OK

Extracting /content/ROM/Going-Up (1983) (Starpeth Corporation) (Prototype)
~.bin 14% OK

Extracting /content/ROM/Golf (32 in 1) (1988) (Atari, Tom Reuterdaahl) (CX26
163P) (PAL).bin 14% OK

Extracting /content/ROM/Golf (Championship Golf) (1980) (Atari, Tom Reuterda
ahl - Sears) (CX2634 - 49-75121) ~.bin 14% OK

Extracting /content/ROM/Golf (Championship Golf) (1980) (Atari, Tom Reuterda
ahl) (CX2634, CX2634P) (PAL).bin 14% OK

Extracting /content/ROM/Golf (Hack) (32 in 1) (Bit Corporation) (R320).bin
14% OK

Extracting /content/ROM/Golf (Unknown) (PAL).bin
15% OK

Extracting /content/ROM/Golf Diagnostic (1983) (Video Soft, Jerry Lawson, D
an McElroy) (Prototype) ~.bin 15% OK

Extracting /content/ROM/Good Luck, Charlie Brown (04-18-1984) (Atari, Chris
topher H. Omarzu, Courtney Granner) (CX26112) (Prototype) ~.bin 1
5% OK

Extracting /content/ROM/Gopher (Gopher Attack) (1982) (U.S. Games Corporati
on - JWDA, Sylvia Day, Todd Marshall, Robin McDaniel, Henry Will IV) (VC200
1) ~.bin 15% OK

Extracting /content/ROM/Gopher (Unknown) (PAL) [a].bin
15% OK

Extracting /content/ROM/Gopher (Unknown) (PAL).bin
15% OK

Extracting /content/ROM/Gopher - Vorsicht Wühlmaus! (1983) (Carrere Video -
JWDA, Sylvia Day, Todd Marshall, Robin McDaniel, Henry Will IV - Teldec - Pr
ism) (USC2001) (PAL).bin 15% OK

Extracting /content/ROM/Gorf (1982) (CBS Electronics - Roklan, Joe Gaucher,
Dan Kurczewski, Alex Leavens, Kathy Von) (4L1751, 4L1752, 4L1753, 4L2275) (P
AL).bin 15% OK

Extracting /content/ROM/Gorf (1982) (CBS Electronics - Roklan, Joe Gaucher,
Dan Kurczewski, Alex Leavens, Kathy Von) (M8776, M8793) (Prototype).bin
15% OK

Extracting /content/ROM/Gorf (1982) (CBS Electronics - Roklan, Joe Gaucher,
Dan Kurczewski, Alex Leavens, Kathy Von) (M8776, M8793) ~.bin 1
5% OK

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Extracting /content/ROM/Grand Prix (1982) (Activision, David Crane - Ariol
a) (EAX-014, PAX-014, EAX-014-04B, EAX-014-04I - 711 014-720) (PAL).bin
████ 15%██████ OK
Extracting /content/ROM/Grand Prix (1982) (Activision, David Crane) (AX-01
4, AX-014-04) ~.bin █████ 15%██████ OK
Extracting /content/ROM/Grand Prix (1983) (CCE) (C-826) [a].bin
████ 15%██████ OK
Extracting /content/ROM/Grand Prix (1983) (CCE) (C-826).bin
████ 15%██████ OK
Extracting /content/ROM/Grand Prix (Robby).bin
████ 15%██████ OK
Extracting /content/ROM/Grand Prix (Unknown) (PAL).bin
████ 15%██████ OK
Extracting /content/ROM/Gravitar (04-12-1983) (Atari, Dan Hitchens, Mimi Ny
den) (CX2685) (Prototype).bin █████ 15%██████ OK
Extracting /content/ROM/Gravitar (1983) (Atari, Dan Hitchens, Mimi Nyden)
(CX2685) ~.bin █████ 15%██████ OK
Extracting /content/ROM/Gravitar (CCE).bin
████ 15%██████ OK
Extracting /content/ROM/Great Escape (AKA Asteroid Fire) (1983) (Bomb - Onb
ase) (CA282) (PAL).bin █████ 15%██████ OK
Extracting /content/ROM/Great Escape (AKA Asteroid Fire) (1983) (Bomb - Onb
ase) (CA282).bin █████ 15%██████ OK
Extracting /content/ROM/Gremlins (Gargoyle) (03-12-1984) (Atari, Mimi Nyde
n, Scott Smith, Robert Vieira) (CX26127) (Prototype).bin █████ 15%██████
OK
Extracting /content/ROM/Gremlins (Gargoyle) (1984) (Atari, Mimi Nyden, Scot
t Smith, Robert Vieira) (CX26127) ~.bin █████ 15%██████ OK
Extracting /content/ROM/Ground Zero (AKA River Raid) (1983) (Goliath - Hot
Shot) (83-113) (PAL).bin █████ 15%██████ OK
Extracting /content/ROM/Grover's Music Maker (Monkey Music) (Kid's Controll
er) (01-18-1983) (Atari - CCW, Stephan R. Keith, Laura Scholl, Preston Stuar
t) (CX26106) (Prototype) ~.bin █████ 15%██████ OK
Extracting /content/ROM/Grover's Music Maker (Monkey Music) (Kid's Controll
er) (12-29-1982) (Atari - CCW, Stephan R. Keith, Laura Scholl, Preston Stuar
t) (CX26106) (Prototype).bin █████ 15%██████ OK
Extracting /content/ROM/Guardian (Cosmic Combat) (Paddle) (1982) (Apollo, L
arry Martin) (AP-2008) (Prototype).bin █████ 15%██████ OK
Extracting /content/ROM/Guardian (Cosmic Combat) (Paddle) (1982) (Apollo, L
arry Martin) (AP-2008) ~.bin █████ 15%██████ OK
Extracting /content/ROM/Guignol (Unknown) (PAL).bin
████ 15%██████ OK
Extracting /content/ROM/Gyruss (1983) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (Prototype) (PAL) [a].bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1983) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (Prototype) (PAL).bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1983) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (Prototype) [a1].bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1983) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (Prototype) [a2].bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1983) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (Prototype).bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1984) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (PAL).bin █████ 15%██████ OK
Extracting /content/ROM/Gyruss (1984) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) ~.bin █████ 15%██████ OK

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Extracting /content/ROM/H.E.R.O. (1984) (Activision, John Van Ryzin) (AZ-03
6-04) ~.bin      15%  OK
Extracting /content/ROM/H.E.R.O. (1984) (Activision, John Van Ryzin) (EAS-0
36-04) (SECAM).bin      15%  OK
Extracting /content/ROM/H.E.R.O. (CCE).bin
15%  OK
Extracting /content/ROM/H.E.R.O. (Tron).bin
15%  OK
Extracting /content/ROM/H.E.R.O. - Helicopter-Held (1984) (Activision, John
Van Ryzin - Ariola) (EAS-036-04, EAS-036-04B, EAS-036-04I - 711 036-720) (PA
L).bin      15%  OK
Extracting /content/ROM/Halloween (1983) (Wizard Video Games - VSS - MicroG
raphicImage, Robert Barber, Tim Martin) (007) (Prototype) [a].bin      1
5%  OK
Extracting /content/ROM/Halloween (1983) (Wizard Video Games - VSS - MicroG
raphicImage, Robert Barber, Tim Martin) (007) (Prototype).bin      1
5%  OK
Extracting /content/ROM/Halloween (1983) (Wizard Video Games - VSS - MicroG
raphicImage, Robert Barber, Tim Martin) (007) ~.bin      15%  OK
Extracting /content/ROM/Hangman (1978) (Atari, Alan Miller) (CX2662P) (PA
L).bin      15%  OK
Extracting /content/ROM/Hangman - Spelling (1978) (Atari, Alan Miller - Sea
rs) (CX2662 - 6-99811) ~.bin      15%  OK
Extracting /content/ROM/Harbor Escape (AKA River Raid) (1983) (Panda) (11
0).bin      15%  OK
Extracting /content/ROM/Hard-Head (1983) (Activision) (Prototype) ~.bin
15%  OK
Extracting /content/ROM/Harem (1982) (Multivision, Michael Case) ~.bin
15%  OK
Extracting /content/ROM/Haunted House (Mystery Mansion, Graves' Manor, Nigh
tmare Manor) (08-12-81) (Atari, James Andreasen - Sears) (CX2654 - 49-75141)
(Prototype).bin      16%  OK
Extracting /content/ROM/Haunted House (Mystery Mansion, Graves' Manor, Nigh
tmare Manor) (09-28-81) (Atari, James Andreasen - Sears) (CX2654 - 49-75141)
(Prototype).bin      16%  OK
Extracting /content/ROM/Haunted House (Mystery Mansion, Graves' Manor, Nigh
tmare Manor) (1982) (Atari, James Andreasen - Sears) (CX2654 - 49-75141) ~.b
in      16%  OK
Extracting /content/ROM/Haunted House (Mystery Mansion, Graves' Manor, Nigh
tmare Manor) (1982) (Atari, James Andreasen) (CX2654) (PAL).bin      1
6%  OK
Extracting /content/ROM/Heart Like a Wheel (1983) (20th Century Fox Video G
ames - Microcomputer Technologies, Jim Collas) (Prototype) ~.bin      1
6%  OK
Extracting /content/ROM/Hell Driver (AKA Racing Car) (1983) (ITT Family Gam
es) (554-37 729) (PAL).bin      16%  OK
Extracting /content/ROM/Hey! Stop! (AKA Keystone Kapers) (1983) (Rainbow Vi
sion - Suntek) (SS-012) (PAL).bin      16%  OK
Extracting /content/ROM/Hey! Stop! (AKA Keystone Kapers) (2600 Screen Searc
h Console) (Jone Yuan Telephonic Enterprise Co).bin      16%  OK
Extracting /content/ROM/Hili Ball (AKA Racquetball) (1983) (Quelle) (689.30
2 8) (PAL).bin      16%  OK
Extracting /content/ROM/Hole Hunter (AKA Topy) (Video Game Cartridge - Ario
la) (TP-606).bin      16%  OK
Extracting /content/ROM/Holey Moley (Kid's Controller) (02-29-1984) (Atari,
Robert C. Polaro) (CX26130) (Prototype) ~.bin      16%  OK

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Extracting /content/ROM/Home Run (Unknown) (PAL).bin
████ 16%████ OK
Extracting /content/ROM/Home Run - Baseball (1978) (Atari, Bob Whitehead -
Sears) (CX2623 - 6-99819, 49-75108, 49-75125) ~.bin █████ 16%████ OK
Extracting /content/ROM/Homerun - Horrorr (32 in 1) (1988) (Atari, Bob Wh
itehead) (CX26163P) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Hot Action Pak - Ghostbusters, Tennis, Plaque Attac
k (1990) (HES - Activision) (542) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Hot Wave (AKA Ram It) (Double-Game Package) (1983)
(Otto Versand) (746422) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Human Cannonball (128-in-1 Junior Console) (PAL).bi
n █████ 16%████ OK
Extracting /content/ROM/Human Cannonball (1979) (Atari) (CX2627, CX2627P)
(PAL).bin █████ 16%████ OK
Extracting /content/ROM/Human Cannonball (32 in 1) (1988) (Atari) (CX26163
P) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Human Cannonball - Cannon Man (1979) (Atari - Sear
s) (CX2627 - 6-99841) ~.bin █████ 16%████ OK
Extracting /content/ROM/Hunt & Score (Keyboard Controller) (1978) (Atari, A
lan Miller) (CX2642) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Hunt & Score - Memory Match (Keyboard Controller)
(1978) (Atari, Alan Miller - Sears) (CX2642 - 6-99814) ~.bin █████ 1
6%████ OK
Extracting /content/ROM/I Want My Mommy (AKA Open, Sesame!) (KidStuff) (198
3) (ZiMAG - Emag - Vidco) (710-111 - GN-010).bin █████ 16%████ OK
Extracting /content/ROM/I.Q. Memory Teaser (AKA IQ 180) (1983) (Suntek) (SS
-033) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Ice Hockey (Canal 3 - Intellivision).bin
████ 16%████ OK
Extracting /content/ROM/Ice Hockey (CCE).bin
████ 16%████ OK
Extracting /content/ROM/Ice Hockey - Eishockey (1981) (Activision, Alan Mil
ler - Ariola) (EAG-012-04I, EAX-012, EAX-012-04B - 711 012-720) (PAL).bin
████ 16%████ OK
Extracting /content/ROM/Ice Hockey - Hockey, Hockey (4 Game in One) (1983)
(Bit Corporation) (PGP210) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Ice Hockey - Le Hockey Sur Glace (1981) (Activisio
n, Alan Miller) (AX-012, CAX-012, AX-012-04) ~.bin █████ 16%████ OK
Extracting /content/ROM/Iceman (Frostbite Beta) (07-27-1983) (Activision, S
teve Cartwright) (AX-031) (Prototype).bin █████ 16%████ OK
Extracting /content/ROM/Ikari Warriors (1991) (Atari - Imagineering, Dan Ki
tchen) (CX26177) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Ikari Warriors (1991) (Atari - Imagineering, Dan Ki
tchen) (CX26177) ~.bin █████ 16%████ OK
Extracting /content/ROM/Im Reich der Spinne (AKA Amidar) (1983) (Quelle) (3
22.773 3) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Im Schutz der Drachen (AKA Dragon Power) (1983) (Qu
elle) (719.252 9) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Imagic Selector ROM (1982) (Imagic) (PAL).bin
████ 16%████ OK
Extracting /content/ROM/Imagic Selector ROM (1982) (Imagic) [a].bin
████ 16%████ OK
Extracting /content/ROM/Imagic Selector ROM (1982) (Imagic) ~.bin
████ 16%████ OK
Extracting /content/ROM/Immies & Aggies (1983) (CCE) (C-838).bin
████ 16%████ OK

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Extracting /content/ROM/Immies & Aggies (Unknown).bin
████ 16%████ OK
Extracting /content/ROM/Immies & Aggies - Immies and Aggies (1983) (ZiMAG -
Emag - Vidco) (715-111 - GN-060) (Prototype) ~.bin █████ 16%████ OK
Extracting /content/ROM/Inca Gold (Unknown) (PAL) [a].bin
████ 16%████ OK
Extracting /content/ROM/Inca Gold (Unknown) (PAL).bin
████ 16%████ OK
Extracting /content/ROM/Inca Gold (Zellers).bin
████ 16%████ OK
Extracting /content/ROM/Indy 500 (Race Car) (Driving Controller) (1977) (At
ari, Carla Meninsky, Ed Riddle) (CX2611, CX2611P) (PAL).bin █████ 1
6%████ OK
Extracting /content/ROM/Indy 500 - Race (Race Car) (Driving Controller) (19
77) (Atari, Carla Meninsky, Ed Riddle - Sears) (CX2611 - 99821, 49-75149) ~.
bin █████ 16%████ OK
Extracting /content/ROM/Infernal Tower (AKA Towering Inferno) (1983) (Carre
re Video - Western Technologies, Jeff Corsiglia, Paul Allen Newell, Tom Slop
er - Teldec - Prism) (USC1009) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Infiltrate (1982) (Apollo - Games by Apollo) (AP-20
06) (Prototype) [a].bin █████ 16%████ OK
Extracting /content/ROM/Infiltrate (1982) (Apollo - Games by Apollo) (AP-20
06) (Prototype).bin █████ 16%████ OK
Extracting /content/ROM/Infiltrate (1982) (Apollo - Games by Apollo) (AP-20
06) ~.bin █████ 16%████ OK
Extracting /content/ROM/Infiltrate (Unknown) (PAL).bin
████ 16%████ OK
Extracting /content/ROM/Infiltrate - Nid d'espions (1982) (Apollo - Games b
y Apollo - RCA Video Jeux) (AP-2006) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Innerspace (1983) (VentureVision, Dan Oliver) (Prot
otype).bin █████ 16%████ OK
Extracting /content/ROM/International Soccer (1982) (M Network - APh Techno
logical Consulting, Kevin Miller) (MT5687) ~.bin █████ 16%████ OK
Extracting /content/ROM/International Soccer (1988) (Telegames) (5687 A279)
(PAL).bin █████ 16%████ OK
Extracting /content/ROM/IQ 180 (2600 Screen Search Console) (Jone Yuan Tele
phonic Enterprise Co).bin █████ 16%████ OK
Extracting /content/ROM/IQ 180 (Unknown).bin
████ 16%████ OK
Extracting /content/ROM/Ixion (1984) (SEGA, Jeff Lorenz) (Prototype) ~.bin
████ 16%████ OK
Extracting /content/ROM/Jacky Jump (AKA Bobby Is Going Home) (1983) (Home V
ision - Gem International Corporation - VDI) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/Jagd auf Diamanten-Frisco (AKA Frisco) (1983) (Quel
le) (875.413 7) (PAL).bin █████ 16%████ OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) (Prototype) [a1].bin █████ 16%████ OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) (Prototype) [a2].bin █████ 16%████ OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) (Prototype) [a3].bin █████ 17%████ OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka

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thy Von) (PB5110) (Prototype) [a4].bin      0000 17%000000 OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) (Prototype) [a5].bin      0000 17%000000 OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1983) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) (Prototype).bin          0000 17%000000 OK
Extracting /content/ROM/James Bond 007 (James Bond Agent 007) (1984) (Parke
r Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Ka
thy Von) (PB5110) ~.bin                    0000 17%000000 OK
Extracting /content/ROM/Jawbreaker (1982) (Tigervision, John Harris - Telde
c) (7-002 - 3.60002 VE) (PAL).bin          0000 17%000000 OK
Extracting /content/ROM/Jawbreaker (1982) (Tigervision, John Harris) (7-00
2) ~.bin                                    0000 17%000000 OK
Extracting /content/ROM/Jawbreaker (Hack) (32 in 1) (Bit Corporation) (R32
0).bin                                     0000 17%000000 OK
Extracting /content/ROM/Jawbreaker (Unknown) (PAL).bin
0000 17%000000 OK
Extracting /content/ROM/Journey Escape (1983) (Data Age, J. Ray Dettling)
(112-006) ~.bin                           0000 17%000000 OK
Extracting /content/ROM/Journey Escape - Rock 'n' Roll Escape (1983) (Gamew
orld, J. Ray Dettling) (133-006) (PAL).bin  0000 17%000000 OK
Extracting /content/ROM/Joust (07-05-1983) (Atari - GCC, Mike Feinstein, Ke
vin Osborn) (CX2691) (Prototype).bin       0000 17%000000 OK
Extracting /content/ROM/Joust (08-09-1983) (Atari - GCC, Mike Feinstein, Ke
vin Osborn) (CX2691) (Prototype).bin       0000 17%000000 OK
Extracting /content/ROM/Joust (1983) (Atari - GCC, Mike Feinstein, Kevin Os
born) (CX2691) ~.bin                      0000 17%000000 OK
Extracting /content/ROM/Joust (1983) (Atari - GCC, Mike Feinstein, Kevin Os
born) (CX2691, CX2691P) (PAL).bin          0000 17%000000 OK
Extracting /content/ROM/Jr. Pac-Man (1986) (Atari - GCC, Ava-Robin Cohen)
(CX26123) ~.bin                           0000 17%000000 OK
Extracting /content/ROM/Jr. Pac-Man (1986) (Atari - GCC, Ava-Robin Cohen)
(CX26123, CX26123P) (PAL).bin              0000 17%000000 OK
Extracting /content/ROM/Jumping Jack (AKA Bobby Is Going Home) (1983) (Dyna
mics) (DY-293005) (PAL).bin               0000 17%000000 OK
Extracting /content/ROM/Jungle Fever (1982) (PlayAround - JHM) (203).bin
0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (02-03-1983) (Atari - GCC, John Allred,
Mike Feinstein) (CX2688) (Prototype).bin    0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (02-25-1983) (Atari - GCC, John Allred,
Mike Feinstein) (CX2688) (Prototype).bin    0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (1983) (Atari - GCC, John Allred, Mike
Feinstein) (CX2688) ~.bin                  0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (1983) (Atari - GCC, John Allred, Mike
Feinstein) (CX2688, CX2688P) (PAL).bin      0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (1983) (CCE) (C-1007).bin
0000 17%000000 OK
Extracting /content/ROM/Jungle Hunt (Unknown).bin
0000 17%000000 OK
Extracting /content/ROM/Kabobber (07-25-1983) (Activision - Boston Design C
enter, Rex Bradford) (Prototype) ~.bin      0000 17%000000 OK
Extracting /content/ROM/Kaboom! (Paddle) (1981) (Activision, Larry Kaplan,
David Crane) (AG-010, CAG-010, AG-010-04) ~.bin 0000 17%000000 OK
Extracting /content/ROM/Kaboom! (Paddle) (CCE).bin
0000 17%000000 OK

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Extracting /content/ROM/Kaboom! - Schneller als der Knall (Paddle) (1981)
 (Activision, Larry Kaplan, David Crane - Ariola) (EAG-010, PAG-010 - 711 010
 -720) (PAL).bin 17% OK
 Extracting /content/ROM/Kamikaze Saucers (1983) (Syncro, Daniel Wolf) (Prot
 otype) ~.bin 17% OK
 Extracting /content/ROM/Kampf dem Steinfresser - Boom Bang (AKA Crackpots)
 (1983) (Quelle - Otto Versand) (463.574 4 - 781393, 986153) (PAL).bin
 17% OK
 Extracting /content/ROM/Kampf im Asteroiden-Guertel - Astrowar (1983) (Quel
 le - Otto Versand) (719.302 2 - 311388) (PAL).bin 17% OK
 Extracting /content/ROM/Kampf um die Schatzinsel (AKA Treasure Discovery)
 (1983) (Quelle) (719.163 8) (PAL).bin 17% OK
 Extracting /content/ROM/Kangaroo (01-19-1983) (Atari - GCC, Kevin Osborn)
 (CX2689) (Prototype).bin 17% OK
 Extracting /content/ROM/Kangaroo (1983) (Atari - GCC, Kevin Osborn) (CX268
 9) ~.bin 17% OK
 Extracting /content/ROM/Kangaroo (1983) (Atari - GCC, Kevin Osborn) (CX268
 9, CX2689P) (PAL).bin 17% OK
 Extracting /content/ROM/Kanguru (AKA Kangaroo) (1983) (Zirok).bin
 17% OK
 Extracting /content/ROM/Karate (1982) (Funvision - Fund. International Co.)
 (PAL).bin 17% OK
 Extracting /content/ROM/Karate (1982) (Ultravision, Joseph Amelio) (1044)
 ~.bin 17% OK
 Extracting /content/ROM/Karate (1987) (Froggo) (FG1001).bin
 17% OK
 Extracting /content/ROM/Karate (Unknown) (PAL).bin
 17% OK
 Extracting /content/ROM/Katastrophen-Einsatz (AKA M.A.S.H.) (1983) (Quelle)
 (876.013 4) (PAL).bin 17% OK
 Extracting /content/ROM/Kaystone Kapers (AKA Keystone Kapers) (1983) (Digit
 el).bin 17% OK
 Extracting /content/ROM/Keystone (AKA Keystone Kapers) (Tiger Vision - Era
 m).bin 17% OK
 Extracting /content/ROM/Keystone Kapers (1983) (Activision, Garry Kitchen)
 (AX-025, AX-025-04) ~.bin 18% OK
 Extracting /content/ROM/Keystone Kapers (1983) (Activision, Garry Kitchen)
 (EAX-025) (SECAM).bin 18% OK
 Extracting /content/ROM/Keystone Kapers (Canal 3 - Intellivision) (C 3014).
 bin 18% OK
 Extracting /content/ROM/Keystone Kapers (Digivision).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Fotomania).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Robby).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Shock Vision).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Unknown) (PAL) [a].bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Unknown) (PAL).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers (Unknown).bin
 18% OK
 Extracting /content/ROM/Keystone Kapers - Raueber und Gendarm (1983) (Activ
 ision, Garry Kitchen - Ariola) (EAX-025, EAX-025-04I - 711 025-725) (PAL).bi

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n      18% OK
Extracting /content/ROM/Keystone Kappers (AKA Keystone Kapers) (1983) (CCE)
(C-816) [a].bin      18% OK
Extracting /content/ROM/Keystone Kappers (AKA Keystone Kapers) (1983) (CCE)
(C-816).bin      18% OK
Extracting /content/ROM/Keystone Keypers (AKA Keystone Kapers) (1983) (Ziro
k).bin      18% OK
Extracting /content/ROM/Kick-Man (01-08-82) (CBS Electronics, Richard K. Ba
laska Jr., Bob Curtiss, Alex Leavens, Alex Nevelson) (Prototype) ~.bin
18% OK
Extracting /content/ROM/Killer Satellites (1983) (Starpeth Corporation, Kev
in Norman) (7) (AR-4103) (PAL).bin      18% OK
Extracting /content/ROM/Killer Satellites (1983) (Starpeth Corporation, Kev
in Norman) (7) (AR-4103) (Prototype).bin      18% OK
Extracting /content/ROM/Killer Satellites (1983) (Starpeth Corporation, Kev
in Norman) (7) (AR-4103) ~.bin      18% OK
Extracting /content/ROM/King Arthur (AKA Dragonfire) (Double-Game Package)
(1983) (Otto Versand) (600273) (PAL).bin      18% OK
Extracting /content/ROM/King Kong (1982) (Tigervision - Software Electronic
s Corporation, Karl T. Olinger - Teldec) (7-001 - 3.60001 VE) (PAL) [a].bin
18% OK
Extracting /content/ROM/King Kong (1982) (Tigervision - Software Electronic
s Corporation, Karl T. Olinger - Teldec) (7-001 - 3.60001 VE) (PAL).bin
18% OK
Extracting /content/ROM/King Kong (1982) (Tigervision - Software Electronic
s Corporation, Karl T. Olinger) (7-001) ~.bin      18% OK
Extracting /content/ROM/Klax (06-14-1990) (Atari - Axlon, Steve DeFrisco)
(CX26192) (Prototype).bin      18% OK
Extracting /content/ROM/Klax (08-18-1990) (Atari - Axlon, Steve DeFrisco)
(CX26192) (Prototype).bin      18% OK
Extracting /content/ROM/Klax (1991) (Atari - Axlon, Steve DeFrisco) (CX2619
2) (PAL) ~.bin      18% OK
Extracting /content/ROM/Knight on the Town (1982) (PlayAround - JHM) (203)
(PAL).bin      18% OK
Extracting /content/ROM/Knight on the Town (1982) (PlayAround - JHM) (203).
bin      18% OK
Extracting /content/ROM/Kool-Aid Man (Kool Aid Pitcher Man) (1983) (M Netwo
rk, Stephen Tatsumi, Jane Terjung - Kool Aid) (MT4648) ~.bin      1
8% OK
Extracting /content/ROM/Krieg der Sterne (AKA Atlantis) (Videospielkassette
- Ariola) (PGP233) (PAL).bin      18% OK
Extracting /content/ROM/Krull (05-27-1983) (Atari, Jerome Domurat, Dave Sta
ugas) (CX2682) (Prototype).bin      18% OK
Extracting /content/ROM/Krull (1983) (Atari, Jerome Domurat, Dave Staugas)
(CX2682) ~.bin      18% OK
Extracting /content/ROM/Krull (CCE).bin
18% OK
Extracting /content/ROM/Krull (Unknown) (PAL).bin
18% OK
Extracting /content/ROM/Kung Fu (AKA Karate) (4 Game in One) (1983) (Bit Co
rporation) (PGP229) (PAL).bin      18% OK
Extracting /content/ROM/Kung Fu Master (CCE).bin
18% OK
Extracting /content/ROM/Kung Fu Superkicks - Pursuit of the Ninja (AKA Chuc
k Norris Superkicks) (1988) (Telegames) (6082 A145) (PAL).bin      1
8% OK

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Extracting /content/ROM/Kung Fu Superkicks - Pursuit of the Ninja (AKA Chuck Norris Superkicks) (1988) (Telegames) (6082 A145).bin 0000 18%000000 OK

Extracting /content/ROM/Kung-Fu Master (1987) (Activision - Imagineering, Dan Kitchen, Garry Kitchen) (AG-039-04) ~.bin 0000 18%000000 OK

Extracting /content/ROM/Kung-Fu Master (1987) (Activision - Imagineering, Dan Kitchen, Garry Kitchen) (EAX-039-04B, EAX-039-04I) (PAL).bin 0000 18%000000 OK

Extracting /content/ROM/Kwibble (Quick Step! Beta) (1983) (Imagic, Dave Johnson) (720119-1A, 03211) (Prototype).bin 0000 18%000000 OK

Extracting /content/ROM/Kyphus (1982) (Apollo, Tim Martin) (AP-2007) (Prototype) ~.bin 0000 18%000000 OK

Extracting /content/ROM/Labyrinth (AKA Phantom Tank) (1983) (Goliath - Hot Shot) (83-411) (PAL).bin 0000 18%000000 OK

Extracting /content/ROM/Labyrinth (AKA Maze Craze) (1983) (Quelle) (805.7846) (PAL).bin 0000 18%000000 OK

Extracting /content/ROM/Labyrinth (Escape from the Mindmaster Beta) (1982) (5) (AR-4200) (Arcadia Corporation, Dennis Caswell) [a].bin 0000 18%000000 OK

Extracting /content/ROM/Labyrinth (Escape from the Mindmaster Beta) (1982) (5) (AR-4200) (Arcadia Corporation, Dennis Caswell).bin 0000 18%000000 OK

Extracting /content/ROM/Lady in Wading (1982) (PlayAround - JHM) (204).bin 0000 18%000000 OK

Extracting /content/ROM/Landung in der Normandie (AKA Commando Raid) (1983) (Quelle) (876.482 1) (PAL).bin 0000 18%000000 OK

Extracting /content/ROM/Landungskommando (AKA Strategy X) (1983) (Quelle) (176.433 1) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Base (AKA The End of the World) (Perry Rhodan-Serie) (1983) (ITT Family Games) (554-33 367) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blaser (AKA The End of the World) (4 Game in One) (1983) (Bit Corporation) (CP405) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (32 in 1) (1988) (Atari) (CX26163P) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (CCE).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (Hack) (2600 Screen Search Console) (Jone Yuan Telephonic Enterprise Co).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (Lazer) (08-08-1980) (Activision, David Crane) (AG-008) (Prototype).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast (Lazer) (1981) (Activision, David Crane) (AG-008) ~.bin 0000 19%000000 OK

Extracting /content/ROM/Laser Blast - Duell im Weltall (Lazer) (1981) (Activision, David Crane - Ariola) (EAG-008, PAG-008, EAG-008-04I - 711 008-720) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Gate (AKA Innerspace) (1983) (CCE) (C-860).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Gates (AKA Innerspace) (1983) (Imagic, Dan Oliver) (720118-1A, 03208) ~.bin 0000 19%000000 OK

Extracting /content/ROM/Laser Gates (AKA Innerspace) (1983) (Imagic, Dan Oliver) (720118-2A, 13208, EIX-007-04I) (PAL).bin 0000 19%000000 OK

Extracting /content/ROM/Laser Gates (AKA Innerspace) (Fotomania).bin 0000 19%000000 OK

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Extracting /content/ROM/Laser Gates (AKA Innerspace) (Unknown) (PAL).bin
████ 19%████ OK
Extracting /content/ROM/Laser Volley - Laaser Voley (AKA Innerspace) (Zelle
rs).bin █████ 19%████ OK
Extracting /content/ROM/Laser-Loop (AKA Base Attack) (1983) (Dynamics) (PA
L).bin █████ 19%████ OK
Extracting /content/ROM/Lasercade (1983) (20th Century Fox Video Games - Vi
dea, Lee Actor) (Prototype) ~.bin █████ 19%████ OK
Extracting /content/ROM/Last Starfighter, The (Universe) (Solaris Beta) (19
84) (Atari, Douglas 'Solaris' Neubauer, Mimi Nyden) (CX26134) (Prototype).bi
n █████ 19%████ OK
Extracting /content/ROM/Lilly Adventure (1983) (Home Vision - Gem Internati
onal Corporation - VDI) (VCS83117) (PAL) ~.bin █████ 19%████ OK
Extracting /content/ROM/Lilly Adventure (2600 Screen Search Console) (Jone
Yuan Telephonic Enterprise Co).bin █████ 19%████ OK
Extracting /content/ROM/Lilly Adventure (Unknown).bin
████ 19%████ OK
Extracting /content/ROM/Lochjaw (1982) (Apollo - Games by Apollo, Steve Str
ingfellow) (AP-2005) ~.bin █████ 19%████ OK
Extracting /content/ROM/Lock 'n' Chase (1982) (M Network - INTV - Aph Techn
ological Consulting, Bruce Pedersen) (MT5663) ~.bin █████ 19%████ OK
Extracting /content/ROM/Lock 'n' Chase (1988) (Telegames) (PAL).bin
████ 19%████ OK
Extracting /content/ROM/Lock 'n' Chase (Hack) (32 in 1) (Bit Corporation)
(R320).bin █████ 19%████ OK
Extracting /content/ROM/Lock 'n' Chase (Unknown) (PAL).bin
████ 19%████ OK
Extracting /content/ROM/London Blitz (1983) (Avalon Hill, Jean Baer, Bill
'Rebecca Ann' Heineman, William O. Sheppard) (5002002) ~.bin █████ 1
9%████ OK
Extracting /content/ROM/Looping (1983) (Coleco - Individeo, Ed Temple) (265
4) (Prototype) ~.bin █████ 19%████ OK
Extracting /content/ROM/Lord of the Rings, The - Journey to Rivendell (The
Lord of the Rings I) (1983) (Parker Brothers, Mark Lesser) (PB5950) (Prototy
pe) [a].bin █████ 19%████ OK
Extracting /content/ROM/Lord of the Rings, The - Journey to Rivendell (The
Lord of the Rings I) (1983) (Parker Brothers, Mark Lesser) (PB5950) (Prototy
pe) ~.bin █████ 19%████ OK
Extracting /content/ROM/Los Angeles 1984 Games (AKA Track and Field) (Track
& Field Controller) (1984) (Atari - GCC, Jaques Hugon, Seth Lipkin) (CX2612
5) (Prototype) (PAL).bin █████ 19%████ OK
Extracting /content/ROM/Lost Luggage (Airport Mayhem) (1982) (Apollo - Game
s by Apollo, Larry Minor, Ernie Runyon, Ed Salvo) (AP-2004) [no opening scen
e] ~.bin █████ 19%████ OK
Extracting /content/ROM/Lost Luggage (Airport Mayhem) (1982) (Apollo - Game
s by Apollo, Larry Minor, Ernie Runyon, Ed Salvo) (AP-2004) ~.bin █████ 1
9%████ OK
Extracting /content/ROM/Lost Luggage - La valise piégée (Airport Mayhem) (1
982) (Apollo - Games by Apollo, Larry Minor, Ernie Runyon, Ed Salvo - RCA Vi
deo Jeux) (AP-2004) (PAL).bin █████ 19%████ OK
Extracting /content/ROM/M.A.D. (1983) (Carrere Video - Western Technologie
s, John Hall - Teldec - Prism) (USC1012) (PAL).bin █████ 19%████ OK
Extracting /content/ROM/M.A.D. (M.A.D. - U.S. vs. U.S.S.R., Missile Interce
pt, Mutually Assured Destruction) (1983) (U.S. Games Corporation - Western T
echnologies, John Hall) (VC1012) ~.bin █████ 19%████ OK
Extracting /content/ROM/M.A.S.H (1983) (20th Century Fox Video Games, Frank

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Cohen, Douglas 'Dallas North' Neubauer) (11011) ~.bin      19%  OK
Extracting /content/ROM/M.A.S.H (1983) (20th Century Fox Video Games, Frank
Cohen, Douglas 'Dallas North' Neubauer) (11111) (PAL).bin    19%  OK
OK
Extracting /content/ROM/M.A.S.H (Hack) (Unknown) (PAL).bin
19%  OK
Extracting /content/ROM/M.A.S.H (Unknown) (PAL) [a].bin
19%  OK
Extracting /content/ROM/M.A.S.H (Unknown) (PAL).bin
19%  OK
Extracting /content/ROM/M.A.S.H (Unknown).bin
19%  OK
Extracting /content/ROM/Mafia (AKA Gangster Alley) (1983) (Rainbow Vision -
Suntek) (SS-010) (PAL).bin    19%  OK
Extracting /content/ROM/MagiCard (Keyboard Controller) (1981) (Computer Mag
ic - CommaVid, John Bronstein) (CM-001) ~.bin      19%  OK
Extracting /content/ROM/Malagai (1983) (Answer Software Corporation - TY As
sociates, Mike Wentz) (ASC1001) ~.bin      19%  OK
Extracting /content/ROM/Mangia' (1983) (Spectravideo) (SA-212) (PAL).bin
19%  OK
Extracting /content/ROM/Mangia' (1983) (Spectravideo) (SA-212) ~.bin
19%  OK
Extracting /content/ROM/Marauder (1982) (Tigervision, Rorke Weigandt - Teld
ec) (7-005 - 3.60004 VE) (PAL).bin    19%  OK
Extracting /content/ROM/Marauder (1982) (Tigervision, Rorke Weigandt) (7-00
5) ~.bin      19%  OK
Extracting /content/ROM/Marauder (2600 Screen Search Console) (Jone Yuan Te
lephonic Enterprise Co).bin    19%  OK
Extracting /content/ROM/Mariana (AKA Seaquest) (1983) (Rainbow Vision - Sun
tek) (SS-017) (PAL).bin    19%  OK
Extracting /content/ROM/Marine Wars (1983) (Gakken) (011) (PAL).bin
19%  OK
Extracting /content/ROM/Marine Wars (1983) (Konami) (RC 102-X 02) ~.bin
19%  OK
Extracting /content/ROM/Marineflieger - River Raid II (AKA Seahawk) (1983)
(Quelle - Otto Versand) (176.764 9 - 781644) (PAL).bin    19%  OK
Extracting /content/ROM/Mario Bros. (1983) (Atari, Dan Hitchens, Mimi Nyde
n) (CX2697) ~.bin      19%  OK
Extracting /content/ROM/Mario Bros. (1983) (Atari, Dan Hitchens, Mimi Nyde
n) (CX2697, CX2697P) (PAL).bin    20%  OK
Extracting /content/ROM/Mario Bros. (Zirok).bin
20%  OK
Extracting /content/ROM/Mario's Bros. (AKA Mario Bros.) (1983) (CCE) (C-100
4).bin    20%  OK
Extracting /content/ROM/Marspatrouille (AKA Gas Hog) (1983) (Quelle) (292.5
42 8) (PAL).bin    20%  OK
Extracting /content/ROM/MASH (AKA M.A.S.H) (1983) (CCE) (C-859).bin
20%  OK
Extracting /content/ROM/Master Builder (1983) (Spectravideo) (SA-210) ~.bin
20%  OK
Extracting /content/ROM/Master Builder - Super Baumeister (1983) (Spectravi
deo - Quelle) (SA-210 - 413.582 8) (PAL).bin    20%  OK
Extracting /content/ROM/Masters of the Universe - The Power of He-Man (198
3) (M Network - INTV, Connie Goldman, Joe King, Patricia Lewis Du Long, Gera
ld Moore, Mike Sanders, Jossef Wagner) (MT4319) ~.bin    20%  OK
Extracting /content/ROM/Math Gran Prix (2600 Screen Search Console) (Jone Y

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uan Telephonic Enterprise Co).bin      20%  OK
Extracting /content/ROM/Math Gran Prix (Math Game) (1982) (Atari, Suki Lee
- Sears) (CX2658 - 49-75128) (Prototype).bin      20%  OK
Extracting /content/ROM/Math Gran Prix (Math Game) (1982) (Atari, Suki Lee
- Sears) (CX2658 - 49-75128) ~.bin      20%  OK
Extracting /content/ROM/Math Gran Prix (Math Game) (1982) (Atari, Suki Lee)
(CX2658) (PAL).bin      20%  OK
Extracting /content/ROM/Math Gran Prix (Unknown) (PAL).bin
20%  OK
Extracting /content/ROM/Maze Craze (Unknown).bin
20%  OK
Extracting /content/ROM/Maze Craze - A Game of Cops 'n Robbers (The Maze)
(1980) (Atari, Richard Maurer) (CX2635, CX2635P) (PAL).bin      20%  OK
Extracting /content/ROM/Maze Craze - A Game of Cops 'n Robbers - Maze Mania
- A Game of Cops 'n Robbers (The Maze) (1980) (Atari, Richard Maurer - Sear
s) (CX2635 - 49-75157) ~.bin      20%  OK
Extracting /content/ROM/McDonald's - Golden Arches Adventure (Big Mac) (06-
06-1983) (Parker Brothers, Dave Engman, Isabel Garret) (Prototype) ~.bin
20%  OK
Extracting /content/ROM/Mega Force (1982) (20th Century Fox Video Games, Do
uglas 'Dallas North' Neubauer) (11005) ~.bin      20%  OK
Extracting /content/ROM/Mega Force (1982) (20th Century Fox Video Games, Do
uglas 'Dallas North' Neubauer) (11105) (PAL) [a].bin      20%  OK
Extracting /content/ROM/Mega Force (1982) (20th Century Fox Video Games, Do
uglas 'Dallas North' Neubauer) (11105) (PAL).bin      20%  OK
Extracting /content/ROM/Mega Force (Unknown).bin
20%  OK
Extracting /content/ROM/Mega Funpak - Gorf, P. Patrol, Pacman, Skeet Shoot
(HES) (PAL).bin      20%  OK
Extracting /content/ROM/MegaBoy (Dynacom) ~.bin
20%  OK
Extracting /content/ROM/Megamania (1982) (Dynacom).bin
20%  OK
Extracting /content/ROM/Megamania (1983) (CCE) (C-829).bin
20%  OK
Extracting /content/ROM/Megamania (1983) (Dactari - Milmar).bin
20%  OK
Extracting /content/ROM/Megamania (1983) (Digitel).bin
20%  OK
Extracting /content/ROM/Megamania (Fotomania).bin
20%  OK
Extracting /content/ROM/MegaMania (Unknown) (PAL) [a].bin
20%  OK
Extracting /content/ROM/MegaMania (Unknown) (PAL).bin
20%  OK
Extracting /content/ROM/MegaMania - A Space Nightmare (1982) (Activision, S
teve Cartwright) (AX-017, AX-017-04) ~.bin      20%  OK
Extracting /content/ROM/MegaMania - A Space Nightmare - Ein Alptraum im Wel
tall (1982) (Activision, Steve Cartwright - Ariola) (EAX-017, EAX-017-04I -
711 017-720) (PAL).bin      20%  OK
Extracting /content/ROM/Mein Weg - My Way (AKA Challenge) (1983) (Quelle -
Otto Versand) (686.561 2 - 781627) (PAL).bin      20%  OK
Extracting /content/ROM/Meltdown (Atom Smasher) (1983) (20th Century Fox Vi
deo Games - Videca, David Ross) (11029) (Prototype) ~.bin      20%  OK

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Extracting /content/ROM/Meteor Defense (AKA Astrowar) (1983) (ITT Family Games) (554-33 391) (PAL).bin 0000 20%000000 OK

Extracting /content/ROM/Meteoroids (Suicide Mission Beta) (1982) (Arcadia Corporation, Steve Hales, Stephen H. Landrum) (4) (AR-4102) (Prototype).bin 0000 20%000000 OK

Extracting /content/ROM/Mickey (AKA Sorcerer's Apprentice) (1984) (Digivision).bin 0000 20%000000 OK

Extracting /content/ROM/Midnight Magic (Pinball Wizard) (1986) (Atari, Glenn Axworthy) (CX26129) (PAL).bin 0000 20%000000 OK

Extracting /content/ROM/Midnight Magic (Pinball Wizard) (1986) (Atari, Glenn Axworthy) (CX26129) ~.bin 0000 20%000000 OK

Extracting /content/ROM/Millipede (01-04-1984) (Atari, Jerome Domurat, Andrew Fuchs, Dave Staugas, Robert Vieira) (CX26118) (Prototype).bin 0000 20%000000 OK

Extracting /content/ROM/Millipede (1984) (Atari - GCC) (CX26118) (Prototype) (PAL).bin 0000 20%000000 OK

Extracting /content/ROM/Millipede (1984) (Atari, Jerome Domurat, Andrew Fuchs, Dave Staugas, Robert Vieira) (CX26118) (Prototype).bin 0000 21%000000 OK

Extracting /content/ROM/Millipede (1984) (Atari, Jerome Domurat, Andrew Fuchs, Dave Staugas, Robert Vieira) (CX26118) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Millipede (1984) (Atari, Jerome Domurat, Andrew Fuchs, Dave Staugas, Robert Vieira) (CX26118, CX26118P) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Mind Maze (Mind Race) (Mindlink Controller) (10-10-1983) (Atari, Peter C. Niday, Gary Shannon, Howard Scott Warshaw) (Prototype) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (1983) (Tigervision - Teldec) (7-008 - 3.60006 VG) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (1983) (Tigervision) (7-008) (Prototype).bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (1983) (Tigervision) (7-008) [fixed] ~.bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (1983) (Tigervision) (7-008) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er Volume II (1983) (Tigervision - Teldec) (7-011 - 3.60015 VG) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miner 2049er Volume II (1983) (Tigervision) (7-011) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Mines of Minos (1982) (CommaVid, Irwin Gaines) (CM-005) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Mines of Minos (Unknown) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Mines of Minos - Im Labyrinth des Roboters (1982) (CommaVid, Irwin Gaines - Ariola) (CM-005 - 712 005-720) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miniature Golf (1979) (Atari, Tom Reuterdaahl) (CX2626, CX2626P) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miniature Golf - Arcade Golf (1979) (Atari, Tom Reuterdaahl - Sears) (CX2626 - 6-99829, 49-75116) ~.bin 0000 21%000000 OK

Extracting /content/ROM/Miniaturer Golf (AKA Miniature Golf) (32 in 1) (1988) (Atari, Tom Reuterdaahl) (CX26163P) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miss Pack Man (AKA Ms. Pac-Man) (Video Game Program) (PAL).bin 0000 21%000000 OK

Extracting /content/ROM/Miss Piggy's Wedding (06-24-1983) (Atari, Dave Jolly, Gary Shannon) (CX26113) (Prototype) ~.bin 0000 21%000000 OK

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Extracting /content/ROM/Miss Piggy's Wedding (1983) (Atari, Dave Joly, Gary
Shannon) (CX26113) (Prototype) (4K) [a].bin      0000 21%000000 OK
Extracting /content/ROM/Miss Piggy's Wedding (1983) (Atari, Dave Joly, Gary
Shannon) (CX26113) (Prototype) (4K).bin          0000 21%000000 OK
Extracting /content/ROM/Missile Command (1981) (Atari, Rob Fulop - Sears)
(CX2638 - 49-75166) (Prototype).bin              0000 21%000000 OK
Extracting /content/ROM/Missile Command (1981) (Atari, Rob Fulop - Sears)
(CX2638 - 49-75166) [no initials] ~.bin          0000 21%000000 OK
Extracting /content/ROM/Missile Command (1981) (Atari, Rob Fulop - Sears)
(CX2638 - 49-75166) ~.bin                        0000 21%000000 OK
Extracting /content/ROM/Missile Command (1981) (Atari, Rob Fulop) (CX2638)
(PAL).bin    0000 21%000000 OK
Extracting /content/ROM/Missile Command (Hack) (32 in 1) (Bit Corporation)
(R320).bin   0000 21%000000 OK
Extracting /content/ROM/Missile Command (Hack) (Unknown) (PAL).bin
0000 21%000000 OK
Extracting /content/ROM/Missile Command (Unknown) (PAL).bin
0000 21%000000 OK
Extracting /content/ROM/Missile Control (1983) (Video Gems) (VG-01) (PAL)
~.bin       0000 21%000000 OK
Extracting /content/ROM/Missile War (AKA Astrowar) (1983) (Goliath - Hot Sh
ot) (83-312) (PAL).bin    0000 21%000000 OK
Extracting /content/ROM/Mission 3,000 A.D. (1983) (Bit Corporation) (PG20
7).bin      0000 21%000000 OK
Extracting /content/ROM/Mission 3,000 A.D. (Unknown) (PAL) [a].bin
0000 21%000000 OK
Extracting /content/ROM/Mission 3,000 A.D. (Unknown) (PAL).bin
0000 21%000000 OK
Extracting /content/ROM/Mission 3,000 A.D. - Mission 3000 (1983) (Bit Corpo
ration) (PG207) (PAL) [demonstration cartridge] ~.bin 0000 21%000000 OK
Extracting /content/ROM/Mission 3,000 A.D. - Mission 3000 (1983) (Bit Corpo
ration) (PG207) (PAL) ~.bin 0000 21%000000 OK
Extracting /content/ROM/Mission Survive (1983) (Video Gems) (VG-04) (PAL)
[louder sounds] ~.bin    0000 21%000000 OK
Extracting /content/ROM/Mission Survive (1983) (Video Gems) (VG-04) (PAL)
~.bin    0000 21%000000 OK
Extracting /content/ROM/Misterious Thief, A (AKA A Mysterious Thief) (1983)
(CCE) (C-839) [a].bin    0000 21%000000 OK
Extracting /content/ROM/Misterious Thief, A (AKA A Mysterious Thief) (1983)
(CCE) (C-839).bin       0000 21%000000 OK
Extracting /content/ROM/Mogul Maniac (Joyboard) (1983) (Amiga - Video Soft)
(3120) ~.bin            0000 21%000000 OK
Extracting /content/ROM/Mole Hunter (AKA Topy) (1983) (Suntek) (SS-023) (PA
L).bin    0000 21%000000 OK
Extracting /content/ROM/Monster aus dem All (AKA Sky Alien) (1983) (Video G
ame - Ariola) (SP-206) (PAL).bin    0000 21%000000 OK
Extracting /content/ROM/Monster Cise (Kid's Controller) (1984) (Atari - CC
W) (CX26131) (Prototype) ~.bin    0000 21%000000 OK
Extracting /content/ROM/Montezuma's Revenge - Featuring Panama Joe (1984)
(Parker Brothers - JWDA, Henry Will IV) (PB5760) ~.bin 0000 21%000000 OK
Extracting /content/ROM/Moon Patrol (05-12-1983) (Atari - GCC, Mark Ackerma
n, Noelie Alito) (CX2692) (Prototype).bin    0000 21%000000 OK
Extracting /content/ROM/Moon Patrol (06-15-1983) (Atari - GCC, Mark Ackerma
n, Noelie Alito) (CX2692) (Prototype).bin    0000 21%000000 OK
Extracting /content/ROM/Moon Patrol (07-04-1983) (Atari - GCC, Mark Ackerma
n, Noelie Alito) (CX2692) (Prototype).bin    0000 21%000000 OK

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Extracting /content/ROM/Moon Patrol (07-26-1983) (Atari - GCC, Mark Ackerman, Noe
lie Alito) (CX2692) (Prototype).bin      21%  OK
Extracting /content/ROM/Moon Patrol (07-31-1983) (Atari - GCC, Mark Ackerman, Noe
lie Alito) (CX2692) (Prototype).bin      21%  OK
Extracting /content/ROM/Moon Patrol (1983) (Atari - GCC, Mark Ackerman, Noe
lie Alito) (CX2692) ~.bin                21%  OK
Extracting /content/ROM/Moon Patrol (1983) (Atari - GCC, Mark Ackerman, Noe
lie Alito) (CX2692, CX2692P) (PAL).bin    21%  OK
Extracting /content/ROM/Moon Patrol (1983) (CCE) (C-1006).bin
22%  OK
Extracting /content/ROM/Moon Patrol (Canal 3 - Intellivision) (C 3004).bin
22%  OK
Extracting /content/ROM/Moon Patrol (Tron).bin
22%  OK
Extracting /content/ROM/Moonsweeper (1983) (Imagic, Bob Smith) (720114-1A,
03207, IZ-001-04) ~.bin                  22%  OK
Extracting /content/ROM/Moonsweeper (1983) (Imagic, Bob Smith) (720114-2A,
13207, EIZ-001-04I) (PAL).bin            22%  OK
Extracting /content/ROM/Moonsweeper (1988) (Activision) (AIZ-001).bin
22%  OK
Extracting /content/ROM/Morse Code Tutor (1979) (Atari, Brad Stewart) ~.bin
22%  OK
Extracting /content/ROM/Motocross (AKA Madcycle) (1983) (Suntek) (SS-022)
(PAL).bin                                 22%  OK
Extracting /content/ROM/Motocross (AKA Motocross Racer) (Joystik).bin
22%  OK
Extracting /content/ROM/Motocross - Motorcross - Motocross (AKA Madcycle)
(1983) (Quelle - Otto Versand) (719.383 2 - 649635, 781393, 781784, 986404)
(PAL).bin                                 22%  OK
Extracting /content/ROM/Motocross Racer (1983) (Xonox - K-Tel Software - Pr
oduct Guild, Anthony R. Henderson) (99008, 6240) ~.bin      22%  OK
Extracting /content/ROM/MotoRodeo (Motor Olympics, Motor Rodeo) (1991) (Ata
ri - Axlon, Steve DeFrisco) (CX26171) (PAL).bin              22%  OK
Extracting /content/ROM/MotoRodeo (Motor Olympics, Motor Rodeo) (1991) (Ata
ri - Axlon, Steve DeFrisco) (CX26171) ~.bin                  22%  OK
Extracting /content/ROM/Mountain King (1983) (CBS Electronics - E.F. Dreyer
- VSS, Ed Salvo) (4L 2738 0000) ~.bin      22%  OK
Extracting /content/ROM/Mountain Man (AKA Ski Hunt) (1983) (ITT Family Game
s) (554-37 737) (PAL).bin                  22%  OK
Extracting /content/ROM/Mouse Trap (1982) (Coleco - JWDA, Sylvia Day, Todd
Marshall, Robin McDaniel, Henry Will IV) (2459) ~.bin       22%  OK
Extracting /content/ROM/Mouse Trap (1983) (CBS Electronics - JWDA, Sylvia D
ay, Todd Marshall, Robin McDaniel, Henry Will IV) (4L1818, 4L1819, 4L1820, 4
L1821) (PAL).bin      22%  OK
Extracting /content/ROM/Mouse Trap (Mouse Attack) (1987) (Atari) (CX26146).
bin      22%  OK
Extracting /content/ROM/Mr. Do! (1983) (CBS Electronics - Individeo, Ed Eng
lish) (4L4478) (PAL).bin                    22%  OK
Extracting /content/ROM/Mr. Do! (1983) (Coleco - Individeo, Ed English) (26
56) ~.bin      22%  OK
Extracting /content/ROM/Mr. Do!'s Castle (03-12-84) (Parker Brothers) (PB58
20) (Prototype) (4K).bin                    22%  OK
Extracting /content/ROM/Mr. Do!'s Castle (1984) (Parker Brothers) (PB5820)
(Prototype).bin      22%  OK
Extracting /content/ROM/Mr. Do!'s Castle (1984) (Parker Brothers) (PB5820)
~.bin      22%  OK

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Extracting /content/ROM/Mr. Postman (1983) (Bit Corporation) (PG209).bin
████ 22%████ OK
Extracting /content/ROM/Mr. Postman (Digitel).bin
████ 22%████ OK
Extracting /content/ROM/Mr. Postman (Fotomania).bin
████ 22%████ OK
Extracting /content/ROM/Mr. Postman (Unknown).bin
████ 22%████ OK
Extracting /content/ROM/Mr. Postman - Der Postmann (1983) (Bit Corporation)
(PG209) (PAL) ~.bin █████ 22%████ OK
Extracting /content/ROM/Mr. Postman - O Carteiro (1983) (CCE) (C-801).bin
████ 22%████ OK
Extracting /content/ROM/Ms Pac-Man (AKA Ms. Pac-Man) (1986) (Artkaris Softw
are) (PAL).bin █████ 22%████ OK
Extracting /content/ROM/Ms. Pac-Man (1982) (Atari - GCC, Mark Ackerman, Gle
nn Parker) (CX2675) (Prototype).bin █████ 22%████ OK
Extracting /content/ROM/Ms. Pac-Man (1983) (Atari - GCC, Mark Ackerman, Gle
nn Parker) (CX2675) ~.bin █████ 22%████ OK
Extracting /content/ROM/Ms. Pac-Man (1983) (Atari - GCC, Mark Ackerman, Gle
nn Parker) (CX2675, CX2675P) (PAL).bin █████ 22%████ OK
Extracting /content/ROM/Ms. Pac-Man (CCE).bin
████ 22%████ OK
Extracting /content/ROM/Music Demo (JWDA, Todd Marshall) ~.bin
████ 22%████ OK
Extracting /content/ROM/Music Machine, The (Paddle) (1983) (Christian Softw
are Development - HomeComputer Software, Dan Schafer, Glenn Stohel, Jon Tede
sco - Sparrow) (GCG 100T, GCG 1001T) ~.bin █████ 22%████ OK
Extracting /content/ROM/My Golf (1990) (HES - Imagineering, David Lubar) (5
35) (PAL) [fixed] ~.bin █████ 22%████ OK
Extracting /content/ROM/My Golf (1990) (HES - Imagineering, David Lubar) (5
35) (PAL) ~.bin █████ 22%████ OK
Extracting /content/ROM/My Golf (CCE) (PAL).bin
████ 22%████ OK
Extracting /content/ROM/Mysterious Thief, A (1983) (ZiMAG - Emag - Vidco)
(GN-070) (Prototype) ~.bin █████ 22%████ OK
Extracting /content/ROM/Mysterious Thief, A (Unknown).bin
████ 22%████ OK
Extracting /content/ROM/Name This Game (1983) (Digitel).bin
████ 22%████ OK
Extracting /content/ROM/Name This Game (Guardians of Treasure, Octopussy)
(1983) (U.S. Games Corporation - JWDA, Roger Booth, Sylvia Day, Ron Dubren,
Todd Marshall, Robin McDaniel, Wes Trager, Henry Will IV) (VC1007) ~.bin
████ 22%████ OK
Extracting /content/ROM/Name This Game (Hack) (32 in 1) (Bit Corporation)
(R320).bin █████ 22%████ OK
Extracting /content/ROM/Name This Game (Hack) (Unknown) (PAL).bin
████ 23%████ OK
Extracting /content/ROM/Name This Game (Unknown) (PAL).bin
████ 23%████ OK
Extracting /content/ROM/Netmaker (AKA Amidar) (1983) (Rainbow Vision - Sunt
ek) (SS-006) (PAL).bin █████ 23%████ OK
Extracting /content/ROM/NFL Football (AKA Football) (32 in 1) (1988) (Atar
i, Bob Whitehead) (CX26163P) (PAL).bin █████ 23%████ OK
Extracting /content/ROM/Night Driver (Paddle) (1980) (Atari, Rob Fulop - Se
ars) (CX2633 - 49-75119) ~.bin █████ 23%████ OK
Extracting /content/ROM/Night Driver (Paddle) (1980) (Atari, Rob Fulop) (CX

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2633, CX2633P) (PAL).bin      23% OK
Extracting /content/ROM/Night Stalker (AKA Dark Cavern) (1988) (Telegames)
(PAL).bin      23% OK
Extracting /content/ROM/Nightmare (1983) (Sancho - Tang's Electronic Co.)
(TEC004) (PAL) ~.bin      23% OK
Extracting /content/ROM/Nightmare (1983) (Sancho - Tang's Electronic Co.)
(TEC004).bin      23% OK
Extracting /content/ROM/Nightmare (CCE).bin
23% OK
Extracting /content/ROM/No Escape! (Escape from Argos) (1983) (Imagic, Mich
ael Greene) (720055-1A, IA3312) ~.bin      23% OK
Extracting /content/ROM/No Escape! (Escape from Argos) (1983) (Imagic, Mich
ael Greene) (720055-2A, IA3312P) (PAL).bin      23% OK
Extracting /content/ROM/Nuts (1983) (TechnoVision - Video Technology) (TVS1
001) (PAL) ~.bin      23% OK
Extracting /content/ROM/Nuts (Unknown) (PAL).bin
23% OK
Extracting /content/ROM/Nuts (Unknown).bin
23% OK
Extracting /content/ROM/Obelix (1984) (Atari, Andrew Fuchs, Jeffrey Gusman,
Dave Joly, Suki Lee) (CX26117) (PAL).bin      23% OK
Extracting /content/ROM/Obelix (1984) (Atari, Andrew Fuchs, Jeffrey Gusman,
Dave Joly, Suki Lee) (CX26117) ~.bin      23% OK
Extracting /content/ROM/Ocean City (AKA Atlantis) (Funvision - Fund. Intern
ational Co.).bin      23% OK
Extracting /content/ROM/Ocean City Defender (AKA Atlantis) (Zellers).bin
23% OK
Extracting /content/ROM/Octopus (AKA Name This Game) (1983) (Carrere Video
- JWDA, Roger Booth, Sylvia Day, Todd Marshall, Robin McDaniel, Wes Trager,
Henry Will IV - Teldec - Prism) (USC1007) (PAL).bin      23% OK
Extracting /content/ROM/Off the Wall (Bizarre Breakout, Peasant King, Zip
'n' Zap) (1989) (Atari - Axlon, John Vifian) (CX26168) (PAL).bin      2
3% OK
Extracting /content/ROM/Off the Wall (Bizarre Breakout, Peasant King, Zip
'n' Zap) (1989) (Atari - Axlon, John Vifian) (CX26168) ~.bin      2
3% OK
Extracting /content/ROM/Off Your Rocker (Joyboard) (1983) (Amiga - Video So
ft, Frank Ellis) (3130) (Prototype) ~.bin      23% OK
Extracting /content/ROM/Official Frogger, The (1983) (Starpath Corporation,
Stephen H. Landrum) (9) (AR-4105) (PAL).bin      23% OK
Extracting /content/ROM/Official Frogger, The (1983) (Starpath Corporation,
Stephen H. Landrum) (9) (AR-4105) ~.bin      23% OK
Extracting /content/ROM/Official Frogger, The (Preview) (1983) (Starpath Co
rporation, Stephen H. Landrum) (9) (AR-4105).bin      23% OK
Extracting /content/ROM/Oink! (1983) (Activision, Mike Lorenzen) (AX-023)
~.bin      23% OK
Extracting /content/ROM/Oink! (CCE).bin
23% OK
Extracting /content/ROM/Oink! (Unknown) (PAL).bin
23% OK
Extracting /content/ROM/Oink! (Unknown).bin
23% OK
Extracting /content/ROM/Oink! - Das Schweinchen und der Wolf (1983) (Activi
sion, Mike Lorenzen - Ariola) (EAX-023 - 711 023-720) (PAL).bin      2
3% OK
Extracting /content/ROM/Omega Race (Booster Grip) (1983) (CBS Electronics,

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Alex Nevelson) (4L 2737 0000) (Prototype).bin      23% OK
Extracting /content/ROM/Omega Race (Booster Grip) (1983) (CBS Electronics,
Alex Nevelson) (4L 2737 0000) ~.bin      23% OK
Extracting /content/ROM/Open Sesame (AKA Open, Sesame!) (1982) (Puzzy - Bit
Corporation) (PG204) (PAL).bin      23% OK
Extracting /content/ROM/Open Sesame (AKA Open, Sesame!) (1983) (Goliath)
(5) (PAL).bin      23% OK
Extracting /content/ROM/Open Sesame (AKA Open, Sesame!) (4 Game in One) (19
83) (Bit Corporation) (PGP204) (PAL).bin      23% OK
Extracting /content/ROM/Open, Sesame! (1982) (Bit Corporation) (PG204).bin
23% OK
Extracting /content/ROM/Open, Sesame! - Abre-te, Sesamo! (1983) (CCE) (C-80
4).bin      23% OK
Extracting /content/ROM/Open, Sesame! - Sesam, Oeffne Dich (1982) (Bit Corp
oration) (PG204) (PAL) ~.bin      23% OK
Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (03-30-1983)
(ATari - CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX2610
1) (Prototype).bin      23% OK
Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (10-20-1982)
(ATari - CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX2610
1) (Prototype).bin      23% OK
Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (12-03-1982)
(ATari - CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX2610
1) (Prototype).bin      23% OK
Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (1984) (Atari
- CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX26101) (PA
L).bin      23% OK
Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (1984) (Atari
- CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX26101) ~.bi
n      23% OK
Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw - Sears)
(CX2639 - 49-75162) [no grid markers] ~.bin      23% OK
Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw - Sears)
(CX2639 - 49-75162) ~.bin      23% OK
Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw) (CX263
9, CX2639P) (PAL) [no grid markers].bin      23% OK
Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw) (CX263
9, CX2639P) (PAL).bin      23% OK
Extracting /content/ROM/Othello (32 in 1) (Bit Corporation) (R320).bin
23% OK
Extracting /content/ROM/Out of Control (1983) (Avalon Hill, Jean Baer, Bill
'Rebecca Ann' Heineman, Jim Jacob) (5005002) ~.bin      23% OK
Extracting /content/ROM/Outlaw (1978) (Atari, David Crane) (CX2605, CX2605
P) (PAL).bin      23% OK
Extracting /content/ROM/Outlaw (32 in 1) (1988) (Atari, David Crane) (CX261
63P) (PAL).bin      23% OK
Extracting /content/ROM/Outlaw - Gunslinger (1978) (Atari, David Crane - Se
ars) (CX2605 - 6-99822, 49-75109) ~.bin      23% OK
Extracting /content/ROM/Overkill (AKA Seahawk) (1983) (Goliath - Hot Shot)
(83-114) (PAL).bin      23% OK
Extracting /content/ROM/Pac Kong (AKA Inca Gold) (1983) (Goliath - Hot Sho
t) (83-414) (PAL).bin      23% OK
Extracting /content/ROM/Pac Kong (AKA Inca Gold) (Funvision - Fund. Interna
tional Co.) (PAL).bin      23% OK
Extracting /content/ROM/Pac Kong (AKA Inca Gold) (Unknown) [a].bin
23% OK

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Extracting /content/ROM/Pac Kong (AKA Inca Gold) (Unknown).bin
████ 23%████ OK
Extracting /content/ROM/Pac Man (AKA Pac-Man) (1983) (CCE) (C-812) [a].bin
████ 23%████ OK
Extracting /content/ROM/Pac Man (AKA Pac-Man) (1983) (CCE) (C-812).bin
████ 24%████ OK
Extracting /content/ROM/Pac Man (AKA Pac-Man) (1983) (Digitel).bin
████ 24%████ OK
Extracting /content/ROM/Pac-Kong (AKA Inca Gold) (1983) (Quelle) (219.292
0) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Pac-Kong (AKA Inca Gold) (1983) (Rainbow Vision - S
untek) (SS-003) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Pac-Man (1982) (Atari, Tod Frye - Sears) (CX2646 -
49-75185) ~.bin █████ 24%████ OK
Extracting /content/ROM/Pac-Man (1982) (Atari, Tod Frye) (CX2646) (PAL).bin
████ 24%████ OK
Extracting /content/ROM/Pac-Man (Fotomania).bin
████ 24%████ OK
Extracting /content/ROM/Pac-Man (Hack) (Unknown) (PAL).bin
████ 24%████ OK
Extracting /content/ROM/Panda (Quest) (AKA Panda Chase) (1983) (Suntek) (SS
-035) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Panda Chase (Penda Chase) (1983) (Home Vision - Gem
International Corporation - VDI) (VCS83105) (PAL) ~.bin █████ 24%████ 0
K
Extracting /content/ROM/Panda Chase (Unknown) (PAL).bin
████ 24%████ OK
Extracting /content/ROM/Parachute (1983) (Home Vision - Gem International C
orporation - VDI) (VCS83123) (PAL) ~.bin █████ 24%████ OK
Extracting /content/ROM/Party Mix (Preview) (1983) (Starpeth Corporation, D
ennis Caswell) (10) (AR-4302) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Party Mix (Preview) (1983) (Starpeth Corporation, D
ennis Caswell) (10) (AR-4302).bin █████ 24%████ OK
Extracting /content/ROM/Party Mix - Bop a Buggy (1 of 3) (Paddle) (1983) (S
tarpath Corporation, Dennis Caswell) (10) (AR-4302) (PAL).bin █████ 2
4%████ OK
Extracting /content/ROM/Party Mix - Bop a Buggy (1 of 3) (Paddle) (1983) (S
tarpath Corporation, Dennis Caswell) (10) (AR-4302).bin █████ 24%████ 0
K
Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep,
Down on the Line, Handcar (Paddle) (1983) (Starpeth Corporation, Dennis Casw
ell) (10) (AR-4302) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep,
Down on the Line, Handcar (Paddle) (1983) (Starpeth Corporation, Dennis Casw
ell) (10) (AR-4302) ~.bin █████ 24%████ OK
Extracting /content/ROM/Party Mix - Down on the Line, Handcar (3 of 3) (Pad
dle) (1983) (Starpeth Corporation, Dennis Caswell) (10) (AR-4302) (PAL).bin
████ 24%████ OK
Extracting /content/ROM/Party Mix - Down on the Line, Handcar (3 of 3) (Pad
dle) (1983) (Starpeth Corporation, Dennis Caswell) (10) (AR-4302).bin
████ 24%████ OK
Extracting /content/ROM/Party Mix - Tug of War, Wizard's Keep (2 of 3) (Pad
dle) (1983) (Starpeth Corporation, Dennis Caswell) (10) (AR-4302) (PAL).bin
████ 24%████ OK
Extracting /content/ROM/Party Mix - Tug of War, Wizard's Keep (2 of 3) (Pad
dle) (1983) (Starpeth Corporation, Dennis Caswell) (10) (AR-4302).bin

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████ 24%████ OK
Extracting /content/ROM/Peek-A-Boo (Dr. Salk) (Kid's Controller) (1984) (Atari, Dr. Lee Salk) (CX26135) (Prototype) ~.bin █████ 24%████ OK
Extracting /content/ROM/Pega Ladrão (AKA Keystone Kapers) (Dismac).bin █████ 24%████ OK
Extracting /content/ROM/Pelé's Soccer - Pelé's Championship Soccer (AKA Championship Soccer) (1981) (Atari, Steve Wright) (CX2616) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Pelé's Soccer - Pelé's Championship Soccer (AKA Championship Soccer) (1981) (Atari, Steve Wright) (CX2616).bin █████ 24%████ OK
Extracting /content/ROM/Pengo (1983) (Atari, Andrew Fuchs, Courtney Granner, Jeffrey Gusman, Mark R. Hahn) (CX2690) (Prototype).bin █████ 24%████ OK
Extracting /content/ROM/Pengo (1984) (Atari, Andrew Fuchs, Courtney Granner, Jeffrey Gusman, Mark R. Hahn) (CX2690) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Pengo (1984) (Atari, Andrew Fuchs, Courtney Granner, Jeffrey Gusman, Mark R. Hahn) (CX2690) ~.bin █████ 24%████ OK
Extracting /content/ROM/Pepsi Invaders - Coke Wins (Coca-Cola, Coke & Pepsi) (1983) (Atari, Richard Maurer, Christopher H. Omarzu - Coca Cola).bin █████ 24%████ OK
Extracting /content/ROM/Pete Rose Baseball (1988) (Absolute Entertainment, Alex DeMeo) (AG-045-04, AK-045-04) ~.bin █████ 24%████ OK
Extracting /content/ROM/Pete Rose Baseball (HES - Absolute Entertainment) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Peter Penguin (AKA Frisco) (Pumuckl-Serie) (1983) (ITT Family Games) (554-37 338) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank (1982) (Bit Corporation) (PG203).bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank (1982) (Puzzy - Bit Corporation) (PG203) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank (1983) (Goliath) (3) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank (Unknown) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank - Phantom-Panzer (1982) (Bit Corporation) (PG203) (PAL) ~.bin █████ 24%████ OK
Extracting /content/ROM/Phantom Tank - Tanque Fantasma (1983) (CCE) (C-808) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantom UFO (AKA Spider Fighter) (4 Game in One) (1983) (Bit Corporation) (PGP212) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phantompanzer II (AKA Thunderground) (1983) (Quelle) (343.273 9) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Phanton Tank (AKA Phantom Tank) (Digivision).bin █████ 24%████ OK
Extracting /content/ROM/Pharaoh's Curse (1983) (TechnoVision - Video Technology) (TVS1003) (PAL) ~.bin █████ 24%████ OK
Extracting /content/ROM/Pharaoh's Curse (Unknown) (PAL).bin █████ 24%████ OK
Extracting /content/ROM/Pharaoh's Curse (Unknown).bin █████ 24%████ OK
Extracting /content/ROM/Phaser Patrol (1982) (Arcadia Corporation, Dennis Caswell) (1) (AR-4000, AR-4100) (Prototype) [a].bin █████ 24%████ OK
Extracting /content/ROM/Phaser Patrol (1982) (Arcadia Corporation, Dennis Caswell) (1) (AR-4000, AR-4100) (Prototype).bin █████ 24%████ OK
Extracting /content/ROM/Phaser Patrol (1982) (Arcadia Corporation, Dennis C

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aswell) (1) (AR-4000, AR-4100) ~.bin      25%  OK
Extracting /content/ROM/Phaser Patrol (1982) (Starpath Corporation, Dennis
Caswell) (1) (AR-4000, AR-4100) (PAL).bin  25%  OK
Extracting /content/ROM/Philly Flasher (AKA Beat 'Em & Eat 'Em) (Paddle) (1
982) (PlayAround - JHM) (201).bin      25%  OK
Extracting /content/ROM/Phoenix (1983) (Atari - GCC, Mike Feinstein, John M
racek) (CX2673) ~.bin      25%  OK
Extracting /content/ROM/Phoenix (1983) (Atari - GCC, Mike Feinstein, John M
racek) (CX2673, CX2673P) (PAL).bin      25%  OK
Extracting /content/ROM/Phoenix (1983) (CCE) (C-1012).bin
25%  OK
Extracting /content/ROM/Phoenix (1986) (Artkaris Software) (PAL).bin
25%  OK
Extracting /content/ROM/Phoenix (Unknown).bin
25%  OK
Extracting /content/ROM/Phoenix (Zirok).bin
25%  OK
Extracting /content/ROM/Pick 'n' Pile (1990) (Salu - Ubi Soft, Dennis M. Ki
ss) (460673) (PAL) ~.bin      25%  OK
Extracting /content/ROM/Pick Up (1983) (20th Century Fox Video Games, Mark
Klein) (11034) (Prototype) ~.bin      25%  OK
Extracting /content/ROM/Picnic (Catch the Fly) (Paddle) (1983) (U.S. Games
Corporation - Western Technologies, Jeff Corsiglia, David Johnson, Tom Slope
r) (VC2004) ~.bin      25%  OK
Extracting /content/ROM/Picnic (Paddle) (1983) (Carrere Video - Western Tec
hnologies, Jeff Corsiglia, David Johnson, Tom Sloper - Teldec - Prism) (USC2
004) (PAL).bin      25%  OK
Extracting /content/ROM/Piece o' Cake (Bakery) (Paddle) (1983) (U.S. Games
Corporation - Western Technologies) (VC2005) ~.bin      25%  OK
Extracting /content/ROM/Pigs in Space - Starring Miss Piggy (1983) (Atari,
Bill Aspromonte, Dave Joly, John Russell, Michael Sierchio, Robert Zdybel)
(CX26114) (PAL).bin      25%  OK
Extracting /content/ROM/Pigs in Space - Starring Miss Piggy (1983) (Atari,
Bill Aspromonte, Dave Joly, John Russell, Michael Sierchio, Robert Zdybel)
(CX26114) (Prototype).bin      25%  OK
Extracting /content/ROM/Pigs in Space - Starring Miss Piggy (1983) (Atari,
Bill Aspromonte, Dave Joly, John Russell, Michael Sierchio, Robert Zdybel)
(CX26114) ~.bin      25%  OK
Extracting /content/ROM/Pinball (AKA Video Pinball) (Zellers).bin
25%  OK
Extracting /content/ROM/Pitfall (AKA Pitfall!) (1983) (CCE) (C-813).bin
25%  OK
Extracting /content/ROM/Pitfall (AKA Pitfall!) (1984) (Supergame) (32).bin
25%  OK
Extracting /content/ROM/Pitfall (AKA Pitfall!) (Fotomania).bin
25%  OK
Extracting /content/ROM/Pitfall (AKA Pitfall!) (Genus).bin
25%  OK
Extracting /content/ROM/Pitfall II - Lost Caverns (1984) (Activision, Steve
Cartwright, David Crane - Ariola) (EAB-035-04 - 711 035-721) (PAL).bin
25%  OK
Extracting /content/ROM/Pitfall II - Lost Caverns (1984) (Activision, Steve
Cartwright, David Crane) (AB-035-04) ~.bin      25%  OK
Extracting /content/ROM/Pitfall! - Abenteuer im Urwald (Jungle Runner) (198
2) (Activision, David Crane - Ariola) (EAX-018, EAX-018-04B, EAX-018-04I - 7
11 018-725) (PAL).bin      25%  OK

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Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Jungle
Runner) (03-18-1983) (Activision, David Crane) (AX-018, AX-018-04) (Prototyp
e).bin      25%      OK
Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Jungle
Runner) (1981) (Activision, David Crane) (AX-018, AX-018-04) (Prototype).bin
25%      OK
Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Jungle
Runner) (1982) (Activision, David Crane) (AX-018, AX-018-04) (Prototype).bin
25%      OK
Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Jungle
Runner) (1982) (Activision, David Crane) (AX-018, AX-018-04) ~.bin      25%
25%      OK
Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Unknow
n) (PAL).bin      25%      OK
Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Unknow
n).bin      25%      OK
Extracting /content/ROM/Pizza Chef (1983) (CCE) (C-837).bin
25%      OK
Extracting /content/ROM/Pizza Chef - Pizza Time (1983) (ZiMAG - Emag - Vidc
o) (713-111 - GN-050) (Prototype) ~.bin      25%      OK
Extracting /content/ROM/Planet of the Apes (1983) (20th Century Fox Video G
ames, John W.S. Marvin) (Prototype) ~.bin      25%      OK
Extracting /content/ROM/Planet Patrol (1982) (Play Video) (PAL).bin
25%      OK
Extracting /content/ROM/Planet Patrol (1982) (Spectravision - Spectravideo)
(SA-202) ~.bin      25%      OK
Extracting /content/ROM/Planet Patrol (1983) (CCE) (C-830) [a].bin
25%      OK
Extracting /content/ROM/Planet Patrol (1983) (CCE) (C-830).bin
25%      OK
Extracting /content/ROM/Planet Patrol (Digivision) (PAL).bin
25%      OK
Extracting /content/ROM/Planet Patrol (Fotomania).bin
25%      OK
Extracting /content/ROM/Planet Patrol (Unknown) (PAL) [a].bin
25%      OK
Extracting /content/ROM/Planet Patrol (Unknown) (PAL).bin
25%      OK
Extracting /content/ROM/Planet Patrol - Planeten Patrouilie (1982) (Spectra
vision - Spectravideo - Quelle) (SA-202 - 412.851 8) (PAL) [different spaces
hip].bin      25%      OK
Extracting /content/ROM/Planet Patrol - Planeten Patrouilie (1982) (Spectra
vision - Spectravideo - Quelle) (SA-202 - 412.851 8) (PAL).bin      2
5%      OK
Extracting /content/ROM/Plaque Attack (1983) (Activision, Steve Cartwright)
(AX-027) ~.bin      25%      OK
Extracting /content/ROM/Plaque Attack (1983) (Dynacom).bin
25%      OK
Extracting /content/ROM/Plaque Attack (CCE).bin
25%      OK
Extracting /content/ROM/Plaque Attack (Digivision).bin
25%      OK
Extracting /content/ROM/Plaque Attack (Unknown) (PAL).bin
25%      OK
Extracting /content/ROM/Plaque Attack (Unknown).bin
25%      OK

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Extracting /content/ROM/Plaque Attack - Schutzt Eure Zaehne (1983) (Activision, Steve Cartwright - Ariola) (EAX-027 - 711 027-722) (PAL).bin 0000 25%000000 OK

Extracting /content/ROM/PlayAround Demo (1982) (PlayAround - JHM).bin 0000 25%000000 OK

Extracting /content/ROM/Pleiades (1983) (UA Limited) (Prototype) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Polaris (02-17-1983) (Tigervision, Robert H. O'Neil) (7-007) (Prototype) (4K).bin 0000 26%000000 OK

Extracting /content/ROM/Polaris (1983) (Tigervision, Robert H. O'Neil - Teldec) (7-007 - 3.60005 VG) (PAL).bin 0000 26%000000 OK

Extracting /content/ROM/Polaris (1983) (Tigervision, Robert H. O'Neil) (7-007) (Prototype).bin 0000 26%000000 OK

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Extracting /content/ROM/Pole Position (1983) (CCE) (C-1002).bin 0000 26%000000 OK

Extracting /content/ROM/Pole Position (RealSports Driving) (05-15-1983) (Atari - GCC, John Allred, Douglas B. Macrae, Betty Ryan Tylko) (CX2694) (Prototype).bin 0000 26%000000 OK

Extracting /content/ROM/Pole Position (RealSports Driving) (1983) (Atari - GCC, John Allred, Douglas B. Macrae, Betty Ryan Tylko) (CX2694) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Pole Position (RealSports Driving) (1983) (Atari - GCC, John Allred, Douglas B. Macrae, Betty Ryan Tylko) (CX2694, CX2694P) (PAL).bin 0000 26%000000 OK

Extracting /content/ROM/Pole Position (Tron).bin 0000 26%000000 OK

Extracting /content/ROM/Polo (1978) (Atari, Carol Shaw - Ralph Lauren) (Prototype) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Pompeii (Labyrinth, Lavarinth) (1983) (Apollo) (AP-2011) (Prototype) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Pooyan (1983) (Gakken) (001) (PAL).bin 0000 26%000000 OK

Extracting /content/ROM/Pooyan (1983) (Konami) (RC 100-X 02) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Pooyan (Hack) (32 in 1) (Bit Corporation) (R320).bin 0000 26%000000 OK

Extracting /content/ROM/Pooyan (Unknown) (PAL).bin 0000 26%000000 OK

Extracting /content/ROM/Popeye (1983) (Parker Brothers - Roklan, Joe Gaucher) (931519) (PAL).bin 0000 26%000000 OK

Extracting /content/ROM/Popeye (1983) (Parker Brothers - Roklan, Joe Gaucher) (PB5370) (Prototype) (4K).bin 0000 26%000000 OK

Extracting /content/ROM/Popeye (1983) (Parker Brothers - Roklan, Joe Gaucher) (PB5370) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Porky's (1983) (20th Century Fox - Lazer Micro Systems - Dunhill Electronics, B. Winston Hendrickson, Randall Hyde, Mark V. Rhoads, John Simonds) (11013) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Power Lords (1983) (Probe 2000 - NAP) (3149VC) (Prototype) ~.bin 0000 26%000000 OK

Extracting /content/ROM/Power Play Arcade Video Game Album IV - Atlantis, Cosmic Ark, Dragonfire (1984) (Amiga) (1125) (Prototype).bin 0000 26%000000 OK

Extracting /content/ROM/Power Play Arcade Video Game Album V - Mogul Maniac, Surf's Up, Off Your Rocker, S.A.C. Alert (1984) (Amiga) (1130) (Prototype)

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e).bin      26%  OK
Extracting /content/ROM/Power Play Arcade Video Game Album, The - Ghost Att
ack, Genesis, Havoc (1983) (Amiga) (1110) (Prototype).bin      26%  OK
Extracting /content/ROM/Pressure Cooker (1983) (Activision, Garry Kitchen -
Ariola) (EAZ-032 - 771 032-712) (PAL).bin      26%  OK
Extracting /content/ROM/Pressure Cooker (1983) (Activision, Garry Kitchen)
(AZ-032) ~.bin      26%  OK
Extracting /content/ROM/Pressure Cooker (CCE).bin
26%  OK
Extracting /content/ROM/Private Eye (1984) (Activision, Bob Whitehead) (AG-
034-04) ~.bin      26%  OK
Extracting /content/ROM/Private Eye (1984) (Activision, Bob Whitehead) (EAZ
-034-04, EAZ-034-04I) (PAL).bin      26%  OK
Extracting /content/ROM/Private Eye (CCE).bin
26%  OK
Extracting /content/ROM/Pumuckl I (AKA Pumuckl at the Zoo) (1983) (ITT Fami
ly Games) (PAL).bin      26%  OK
Extracting /content/ROM/Pursuit of the Pink Panther (Pink Panther - The Vid
eo Game, Adventures of the Pink Panther) (1983) (Probe 2000 - NAP, Roger Boo
th, Todd Marshall, Robin McDaniel, Jim Wickstead) (3152VC) (Prototype) ~.bin
26%  OK
Extracting /content/ROM/Pygmy (AKA Lock 'n' Chase) (Double-Game Package) (1
983) (Otto Versand) (311377) (PAL).bin      26%  OK
Extracting /content/ROM/Pyramid War (AKA Chopper Command) (1983) (Rainbow V
ision - Suntek) (SS-004) (PAL).bin      26%  OK
Extracting /content/ROM/Pyramid War (AKA Chopper Command) (Unknown) (PAL)
[a].bin      26%  OK
Extracting /content/ROM/Pyramid War (AKA Chopper Command) (Unknown) (PAL).b
in      26%  OK
Extracting /content/ROM/Q-bert (1983) (Parker Brothers - Western Technologi
es, Dave Hampton, Tom Sloper) (931517) (PAL).bin      26%  OK
Extracting /content/ROM/Q-bert (1983) (Parker Brothers - Western Technologi
es, Dave Hampton, Tom Sloper) (PB5360) ~.bin      26%  OK
Extracting /content/ROM/Q-bert (1987) (Atari) (CX26150).bin
26%  OK
Extracting /content/ROM/Q-bert (1987) (Atari) (CX26150P) (PAL).bin
26%  OK
Extracting /content/ROM/Q-bert (Unknown) (PAL).bin
26%  OK
Extracting /content/ROM/Q-bert (Unknown).bin
26%  OK
Extracting /content/ROM/Q-bert's Qubes (1984) (Parker Brothers - JWDA, Todd
Marshall) (PB5550) (Prototype) (4K).bin      26%  OK
Extracting /content/ROM/Q-bert's Qubes (1984) (Parker Brothers - JWDA, Todd
Marshall) (PB5550) ~.bin      26%  OK
Extracting /content/ROM/Quadrun (12-06-1982) (Atari, Frank Hausman, Mimi Ny
den, Steve Woita) (CX2686) (Prototype) (4K).bin      26%  OK
Extracting /content/ROM/Quadrun (18-03-1982) (Atari, Frank Hausman, Mimi Ny
den, Steve Woita) (CX2686) (Prototype).bin      27%  OK
Extracting /content/ROM/Quadrun (1983) (Atari, Frank Hausman, Mimi Nyden, S
teve Woita) (CX2686) (Prototype).bin      27%  OK
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teve Woita) (CX2686) ~.bin      27%  OK
Extracting /content/ROM/Quest for Quintana Roo (1984) (Sunrise Software - V
SS) (1603) ~.bin      27%  OK

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Extracting /content/ROM/Quest for Quintana Roo (1988) (Telegames - VSS) (60
57 A227) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Quest for Quintana Roo (1988) (Telegames - VSS) (60
57 A227).bin      0000 27%000000 OK
Extracting /content/ROM/Quick Step! (Hop To It, Kwibble) (1983) (Imagic, Da
ve Johnson) (720119-1A, 03211) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Quick Step! (Hop To It, Kwibble) (1983) (Imagic, Da
ve Johnson) (720119-2A, 13211, EIX-004-04I) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Rabbit Transit (08-29-1983) (Atari) (Prototype).bin
0000 27%000000 OK
Extracting /content/ROM/Rabbit Transit (Hopalong Catastrophe) (1983) (Starp
ath Corporation, Brian McGhie) (8) (AR-4104) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Rabbit Transit (Hopalong Catastrophe) (1983) (Starp
ath Corporation, Brian McGhie) (8) (AR-4104) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Rabbit Transit (Hopalong Catastrophe) (Preview) (19
83) (Starpath Corporation, Brian McGhie) (8) (AR-4104).bin      0000 27%000000
OK
Extracting /content/ROM/Racer (1982) (Atari - Roklan, Joe Gaucher) (Prototy
pe) [a].bin      0000 27%000000 OK
Extracting /content/ROM/Racer (1982) (Atari - Roklan, Joe Gaucher) (Prototy
pe) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Racing Car (1983) (Home Vision, R.J.P.G. - Gem Inte
rnational Corporation - VDI) (VCS83124) (PAL) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Racing Car (Unknown).bin
0000 27%000000 OK
Extracting /content/ROM/Racquetball (1982) (Apollo - Games by Apollo, Ed Sa
lvo, Byron Parks) (AP-2003) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Racquetball (1982) (Apollo - Games by Apollo, Ed Sa
lvo, Byron Parks) (AP-2003) [a].bin      0000 27%000000 OK
Extracting /content/ROM/Racquetball (1982) (Apollo - Games by Apollo, Ed Sa
lvo, Byron Parks) (AP-2003) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Racquetball (Unknown) (PAL).bin
0000 27%000000 OK
Extracting /content/ROM/Racquetball (Unknown).bin
0000 27%000000 OK
Extracting /content/ROM/Rad Action Pak - Kung-Fu Master, Freeway, Frostbite
(1990) (HES - Activision) (559) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Radar (AKA Exocet) (1983) (CCE) (C-867).bin
0000 27%000000 OK
Extracting /content/ROM/Radar (AKA Exocet) (Zellers).bin
0000 27%000000 OK
Extracting /content/ROM/Radar Lock (Dog Fight) (1989) (Atari, Douglas Neuba
uer) (CX26176) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Radar Lock (Dog Fight) (1989) (Atari, Douglas Neuba
uer) (CX26176) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Raft Rider (1983) (U.S. Games Corporation - Western
Technologies, Dave Hampton) (VC2006) ~.bin      0000 27%000000 OK
Extracting /content/ROM/Raft Rider (2600 Screen Search Console) (Jones Yuan
Telephonic Enterprise Co).bin      0000 27%000000 OK
Extracting /content/ROM/Raft Rider (Unknown) (PAL).bin
0000 27%000000 OK
Extracting /content/ROM/Raiders of the Lost Ark (06-14-82) (Atari, Jerome D
omurat, Howard Scott Warshaw) (CX2659) (Prototype).bin      0000 27%000000 OK
Extracting /content/ROM/Raiders of the Lost Ark (1982) (Atari, Jerome Domur
at, Howard Scott Warshaw) (CX2659) (PAL).bin      0000 27%000000 OK
Extracting /content/ROM/Raiders of the Lost Ark (1982) (Atari, Jerome Domur

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at, Howard Scott Warshaw) (CX2659) ~.bin      27%      OK
Extracting /content/ROM/Raketen-Angriff (AKA Missile Control) (Videospielka
ssette - Ariola) (PGP236) (PAL).bin      27%      OK
Extracting /content/ROM/Ram It (1983) (Telesys, Jim Rupp) (1004) (PAL).bin
27%      OK
Extracting /content/ROM/Ram It (1983) (Telesys, Jim Rupp) (1004) ~.bin
27%      OK
Extracting /content/ROM/Ram It (Unknown) (PAL).bin
27%      OK
Extracting /content/ROM/Rampage! (1989) (Activision - Bobco, Robert C. Pola
ro) (AK-049-04) ~.bin      27%      OK
Extracting /content/ROM/Rampage! (1989) (Activision - Bobco, Robert C. Pola
ro) (EAK-049-04B) (PAL).bin      27%      OK
Extracting /content/ROM/Raumbasen-Attacke - Base Attack (1983) (Quelle - Ot
to Versand) (732.074 0 - 781778) (PAL).bin      27%      OK
Extracting /content/ROM/Raumpatrouille (AKA X'Mission) (1983) (Quelle) (73
1.064 2) (PAL).bin      27%      OK
Extracting /content/ROM/Reactor (1983) (Parker Brothers, Charlie Heath) (93
1506) (PAL).bin      27%      OK
Extracting /content/ROM/Reactor (1983) (Parker Brothers, Charlie Heath) (PB
5330) ~.bin      27%      OK
Extracting /content/ROM/RealSports Baseball (07-09-1982) (Atari, Eric Mangh
ise, Mimi Nyden, Joseph Tung) (CX2640) (Prototype).bin      27%      OK
Extracting /content/ROM/RealSports Baseball (1982) (Atari, Eric Manghise, M
imi Nyden, Joseph Tung) (CX2640) (Prototype) (4K).bin      27%      OK
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imi Nyden, Joseph Tung) (CX2640) (Prototype).bin      28%      OK
Extracting /content/ROM/RealSports Baseball (1982) (Atari, Eric Manghise, M
imi Nyden, Joseph Tung) (CX2640) ~.bin      28%      OK
Extracting /content/ROM/RealSports Basketball (01-11-1983) (Atari - Roklan,
Joe Gaucher) (CX2679) (Prototype) (PAL) ~.bin      28%      OK
Extracting /content/ROM/RealSports Basketball (12-28-1982) (Atari - Roklan,
Joe Gaucher) (CX2679) (Prototype) (PAL).bin      28%      OK
Extracting /content/ROM/RealSports Boxing (1987) (Atari - Imagineering, Ale
x DeMeo) (CX26135) ~.bin      28%      OK
Extracting /content/ROM/RealSports Boxing (1987) (Atari - Imagineering, Ale
x DeMeo) (CX26135, CX26135P) (PAL).bin      28%      OK
Extracting /content/ROM/RealSports Football (Football II) (1982) (Atari, Al
an J. Murphy, Robert Zdybel) (CX2668) (Prototype).bin      28%      OK
Extracting /content/ROM/RealSports Football (Football II) (1982) (Atari, Al
an J. Murphy, Robert Zdybel) (CX2668) ~.bin      28%      OK
Extracting /content/ROM/RealSports Soccer - Football - RealSports Soccer (1
983) (Atari, Jerome Domurat, Michael Sierchio) (CX2667) (Prototype).bin
28%      OK
Extracting /content/ROM/RealSports Soccer - Football - RealSports Soccer (1
983) (Atari, Jerome Domurat, Michael Sierchio) (CX2667) [no opening tune] ~.
bin      28%      OK
Extracting /content/ROM/RealSports Soccer - Football - RealSports Soccer (1
983) (Atari, Jerome Domurat, Michael Sierchio) (CX2667) ~.bin      2
8%      OK
Extracting /content/ROM/RealSports Soccer - Football - RealSports Soccer (1
983) (Atari, Jerome Domurat, Michael Sierchio) (CX2667, CX2667P) (PAL).bin
28%      OK
Extracting /content/ROM/RealSports Tennis (1982) (Atari - GCC) (CX2680) (Pr
ototype).bin      28%      OK
Extracting /content/ROM/RealSports Tennis (1983) (Atari - GCC) (CX2680) ~.b

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in      28%      OK
Extracting /content/ROM/RealSports Tennis (1983) (Atari - GCC) (CX2680, CX2
680P) (PAL).bin      28%      OK
Extracting /content/ROM/RealSports Volleyball (05-11-1982) (Atari, Jim Huether, Alan J. Murphy, Robert C. Polaro) (CX2666) (Prototype).bin      2
8%      OK
Extracting /content/ROM/RealSports Volleyball (1982) (Atari, Jim Huether, A
lan J. Murphy, Robert C. Polaro) (CX2666) (Prototype).bin      28%      OK
Extracting /content/ROM/RealSports Volleyball (1982) (Atari, Jim Huether, A
lan J. Murphy, Robert C. Polaro) (CX2666) ~.bin      28%      OK
Extracting /content/ROM/RealSports Volleyball (1982) (Atari, Jim Huether, A
lan J. Murphy, Robert C. Polaro) (CX2666, CX2666P) (PAL).bin      2
8%      OK
Extracting /content/ROM/Red Sea Crossing (1983) (Inspirational Video Concep
ts, Steve Shustack) (321430) ~.bin      28%      OK
Extracting /content/ROM/Rescue Terra I (1982) (VentureVision, Dan Oliver)
(VV2001) ~.bin      28%      OK
Extracting /content/ROM/Resgate Espacial (AKA Moonsweeper) (CCE).bin
28%      OK
Extracting /content/ROM/Revenge of the Beefsteak Tomatoes (Revenge of the C
herry Tomatoes) (1983) (20th Century Fox Video Games, John Russell) (11016)
~.bin      28%      OK
Extracting /content/ROM/Reversi (AKA Othello) (32 in 1) (1988) (Atari, Ed L
ogg, Carol Shaw) (CX26163P) (PAL).bin      28%      OK
Extracting /content/ROM/Riddle of the Sphinx (1982) (Imagic, Rob Fulop, Bob
Smith) (720106-1A, IA3600) ~.bin      28%      OK
Extracting /content/ROM/Riddle of the Sphinx (1982) (Imagic, Rob Fulop, Bob
Smith) (720106-2A, IA3600P, EIX-009-04I) (PAL).bin      28%      OK
Extracting /content/ROM/River Patrol (1984) (Tigervision) (7-004) ~.bin
28%      OK
Extracting /content/ROM/River Raid (1982) (Activision, Carol Shaw) (AX-020,
AX-020-04) ~.bin      28%      OK
Extracting /content/ROM/River Raid (1982) (Activision, Carol Shaw) (EAX-02
0) (SECAM).bin      28%      OK
Extracting /content/ROM/River Raid (1983) (CCE) (C-811) [a].bin
28%      OK
Extracting /content/ROM/River Raid (1983) (CCE) (C-811).bin
28%      OK
Extracting /content/ROM/River Raid (1983) (Dactari - Milmar).bin
28%      OK
Extracting /content/ROM/River Raid (1983) (Digitel).bin
28%      OK
Extracting /content/ROM/River Raid (1984) (Galaga Games) (PAL).bin
28%      OK
Extracting /content/ROM/River Raid (1984) (Galaga Games).bin
28%      OK
Extracting /content/ROM/River Raid (1984) (Supergame) (71).bin
28%      OK
Extracting /content/ROM/River Raid (Canal 3 - Intellivision) (C 3045).bin
28%      OK
Extracting /content/ROM/River Raid (Digivision).bin
28%      OK
Extracting /content/ROM/River Raid (Fotomania).bin
28%      OK
Extracting /content/ROM/River Raid (Genus).bin

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0000 28%000000 OK
Extracting /content/ROM/River Raid (Hack) (2600 Screen Search Console) (Jon
e Yuan Telephonic Enterprise Co) [a].bin 0000 28%000000 OK
Extracting /content/ROM/River Raid (Hack) (2600 Screen Search Console) (Jon
e Yuan Telephonic Enterprise Co).bin 0000 28%000000 OK
Extracting /content/ROM/River Raid (Hack) (Unknown) (PAL) [a].bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Hack) (Unknown) (PAL).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Robby) (18).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Tron).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Unknown) (PAL).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Unknown) [a].bin
0000 28%000000 OK
Extracting /content/ROM/River Raid (Unknown).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid - Jagdflieger (1982) (Activision, Carol
Shaw - Ariola) (EAX-020, EAX-020-04B, EAX-020-04I - 711 020-720) (PAL).bin
0000 28%000000 OK
Extracting /content/ROM/River Raid II (1988) (Activision - Imagineering, Da
n Kitchen, David Lubar) (AK-048-04) ~.bin 0000 28%000000 OK
Extracting /content/ROM/River Raid II (1988) (Activision - Imagineering, Da
n Kitchen, David Lubar) (EAK-048-04, EAK-048-04B) (PAL).bin 0000 2
9%000000 OK
Extracting /content/ROM/River Raid II (AKA River Raid) (1985) (Digitel).bin
0000 29%000000 OK
Extracting /content/ROM/River Raid II (AKA River Raid) (Digimax).bin
0000 29%000000 OK
Extracting /content/ROM/River Raid II (AKA River Raid) (Supergame).bin
0000 29%000000 OK
Extracting /content/ROM/River Raid III (AKA River Raid) (1985) (Digitel).bi
n 0000 29%000000 OK
Extracting /content/ROM/Road Runner (06-25-1984) (Atari - Bobco, Robert C.
Polaro) (CX2663) (Prototype).bin 0000 29%000000 OK
Extracting /content/ROM/Road Runner (1989) (Atari - Bobco, Robert C. Polar
o) (CX2663) (PAL).bin 0000 29%000000 OK
Extracting /content/ROM/Road Runner (1989) (Atari - Bobco, Robert C. Polar
o) (CX2663) ~.bin 0000 29%000000 OK
Extracting /content/ROM/Road Runner (CCE).bin
0000 29%000000 OK
Extracting /content/ROM/Robin Hood (1983) (Xonox - K-Tel Software - Compute
r Magic) (99005, 6220, 6250) (PAL).bin 0000 29%000000 OK
Extracting /content/ROM/Robin Hood (1983) (Xonox - K-Tel Software - Compute
r Magic) (99005, 6220, 6250) ~.bin 0000 29%000000 OK
Extracting /content/ROM/Robin Hood (AKA Save Our Ship) (1983) (Quelle) (68
4.733 9) (PAL).bin 0000 29%000000 OK
Extracting /content/ROM/Robot Fight (AKA Space Robot) (1983) (Home Vision -
Gem International Corporation - VDI) (VCS83101) (PAL).bin 0000 29%000000
OK
Extracting /content/ROM/Robot Tank (HES - Activision) (PAL).bin
0000 29%000000 OK
Extracting /content/ROM/Robot Tank (Robotank) (1983) (Activision, Alan Mill
er) (AZ-028, AG-028-04) ~.bin 0000 29%000000 OK

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Extracting /content/ROM/Robot Tank - Rebellion der Roboter (Robotank) (198
3) (Activision, Alan Miller - Ariola) (EAZ-028 - 711 028-725) (PAL).bin
████ 29%████ OK
Extracting /content/ROM/Roc 'n Rope (1984) (CBS Electronics - Individeo, Ed
English) (4L1751) (PAL).bin █████ 29%████ OK
Extracting /content/ROM/Roc 'n Rope (1984) (Coleco - Individeo, Ed English)
(2667) ~.bin █████ 29%████ OK
Extracting /content/ROM/Rocky & Bullwinkle (04-20-1983) (M Network, Steve C
randall, Patricia Lewis Du Long) (MT4646) (Prototype) ~.bin █████ 2
9%████ OK
Extracting /content/ROM/Rodeo Champ (AKA Stampede) (4 Game in One) (1983)
(Bit Corporation) (PGP218) (PAL).bin █████ 29%████ OK
Extracting /content/ROM/Room of Doom (1982) (CommaVid, Irwin Gaines) (CM-00
4) ~.bin █████ 29%████ OK
Extracting /content/ROM/Room of Doom (Unknown) (PAL).bin
████ 29%████ OK
Extracting /content/ROM/Room of Doom - Raum ohne Ausweg (1982) (CommaVid, I
rwin Gaines - Ariola) (CM-004 - 712 004-720) (PAL).bin █████ 29%████ OK
Extracting /content/ROM/Rubik's Cube (AKA Atari Video Cube) (1984) (Atari -
GCC) (CX2698).bin █████ 29%████ OK
Extracting /content/ROM/Rubik's Cube 3-D (1982) (Atari, Peter C. Niday) (Pr
ototype) ~.bin █████ 29%████ OK
Extracting /content/ROM/Rush Hour (1983) (Commavid, Ben Burch) (CM-010) (Pr
ototype) [a1].bin █████ 29%████ OK
Extracting /content/ROM/Rush Hour (1983) (Commavid, Ben Burch) (CM-010) (Pr
ototype) [a2].bin █████ 29%████ OK
Extracting /content/ROM/Rush Hour (1983) (Commavid, Ben Burch) (CM-010) (Pr
ototype) ~.bin █████ 29%████ OK
Extracting /content/ROM/S.A.C. Alert (Joyboard) (1983) (Amiga - Video Soft)
(3135) (Prototype) (PAL).bin █████ 29%████ OK
Extracting /content/ROM/S.A.C. Alert (Joyboard) (1983) (Amiga - Video Soft)
(3135) (Prototype) ~.bin █████ 29%████ OK
Extracting /content/ROM/Saboteur (Sabotage) (05-20-1983) (Atari, Jerome Dom
urat, Howard Scott Warshaw) (CX26119) (Prototype).bin █████ 29%████ OK
Extracting /content/ROM/Saboteur (Sabotage) (06-09-1983) (Atari, Jerome Dom
urat, Howard Scott Warshaw) (CX26119) (Prototype).bin █████ 29%████ OK
Extracting /content/ROM/Saboteur (Sabotage) (06-15-1983) (Atari, Jerome Dom
urat, Howard Scott Warshaw) (CX26119) (Prototype).bin █████ 29%████ OK
Extracting /content/ROM/Saboteur (Sabotage) (09-02-1983) (Atari, Jerome Dom
urat, Howard Scott Warshaw) (CX26119) (Prototype).bin █████ 29%████ OK
Extracting /content/ROM/Saboteur (Sabotage) (12-20-1983) (Atari, Jerome Dom
urat, Howard Scott Warshaw) (CX26119) (Prototype) ~.bin █████ 29%████ 0
K
Extracting /content/ROM/Save Mary! (Saving Mary) (04-03-1989) (Atari - Axlo
n, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26178) (Prototype).bi
n █████ 29%████ OK
Extracting /content/ROM/Save Mary! (Saving Mary) (10-24-1991) (Atari - Axlo
n, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26178) (Prototype) (P
AL).bin █████ 29%████ OK
Extracting /content/ROM/Save Mary! (Saving Mary) (11-21-1989) (Atari - Axlo
n, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26178) (Prototype) ~.
bin █████ 29%████ OK
Extracting /content/ROM/Save Our Ship (1983) (TechnoVision - Video Technolo
gy) (TVS1002) (PAL) ~.bin █████ 29%████ OK
Extracting /content/ROM/Save Our Ship (Hack) (32 in 1) (Bit Corporation) (R
320).bin █████ 29%████ OK

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Extracting /content/ROM/Save Our Ship (Unknown) (PAL).bin
████ 29%████ OK
Extracting /content/ROM/Save Our Ship (Unknown).bin
████ 29%████ OK
Extracting /content/ROM/Save the Whales (02-07-1983) (20th Century Fox Video
o Games - Beck-Tech, Steve Beck) (11035) (Prototype).bin █████ 29%████
OK
Extracting /content/ROM/Save the Whales (1983) (20th Century Fox Video Game
s - Beck-Tech, Steve Beck) (11035) (Prototype) ~.bin █████ 29%████ OK
Extracting /content/ROM/Schiessbude (AKA Carnival) (1983) (Quelle) (701.134
9) (PAL).bin █████ 29%████ OK
Extracting /content/ROM/Schnapp die Apfeldiebe (AKA Plaque Attack) (1983)
(Quelle) (429.663 8) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Schussel, der Polizistenschreck (AKA Guignol) (198
3) (Quelle) (731.273 9) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Scuba Diver (AKA Skindiver) (1983) (Panda) (104).bi
n █████ 30%████ OK
Extracting /content/ROM/Scuba Diver (AKA Skindiver) (Zellers).bin
████ 30%████ OK
Extracting /content/ROM/Sea Battle (High Seas) (1983) (Intellivision Produc
tions - M Network - APH Technological Consulting, Bruce Pedersen, Larry Zwic
k) (MT5860) ~.bin █████ 30%████ OK
Extracting /content/ROM/Sea Hawk (AKA Seahawk) (1983) (Panda) (108).bin
████ 30%████ OK
Extracting /content/ROM/Sea Hawk (AKA Seahawk) (1987) (Froggo) (FG1008).bin
████ 30%████ OK
Extracting /content/ROM/Sea Hawk (AKA Seahawk) (CCE).bin
████ 30%████ OK
Extracting /content/ROM/Sea Hawk (AKA Seahawk) (Zellers).bin
████ 30%████ OK
Extracting /content/ROM/Sea Hunt (AKA Skindiver) (1987) (Froggo) (FG1009).b
in █████ 30%████ OK
Extracting /content/ROM/Sea Hunt (AKA Skindiver) (CCE).bin
████ 30%████ OK
Extracting /content/ROM/Sea Monster (1982) (Bit Corporation) (PG201).bin
████ 30%████ OK
Extracting /content/ROM/Sea Monster (1982) (Puzzy - Bit Corporation) (PG20
1) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Sea Monster (1983) (Goliath) (8) (PAL).bin
████ 30%████ OK
Extracting /content/ROM/Sea Monster (Unknown) (PAL).bin
████ 30%████ OK
Extracting /content/ROM/Sea Monster - O Monstro Marinho (1983) (CCE) (C-80
5).bin █████ 30%████ OK
Extracting /content/ROM/Sea Monster - See-Monster (1982) (Bit Corporation)
(PG201) (PAL) ~.bin █████ 30%████ OK
Extracting /content/ROM/Seahawk (1982) (John Sands Electronics) (JS145A) (P
AL).bin █████ 30%████ OK
Extracting /content/ROM/Seahawk (1982) (Sancho - Tang's Electronic Co.) (TE
C002) (PAL) ~.bin █████ 30%████ OK
Extracting /content/ROM/Seamons - Monstre des Mers (1982) (Puzzy - Bit C
orporation) (PG201).bin █████ 30%████ OK
Extracting /content/ROM/Seaquest (1983) (Activision, Steve Cartwright) (AX-
022) ~.bin █████ 30%████ OK
Extracting /content/ROM/Seaquest (1983) (CCE) (C-815) [a].bin
████ 30%████ OK

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Extracting /content/ROM/Seaquest (1983) (CCE) (C-815).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (1983) (Dinatronic).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (1983) (Dynacom).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (Canal 3 - Intellivision).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (Digivision).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (Fotomania).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest (Unknown) (PAL).bin
████ 30%████ OK
Extracting /content/ROM/Seaquest - Rettung aus der Tiefe (1983) (Activision, Steve Cartwright - Ariola) (EAX-022, EAX-022-04I - 711 022-720) (PAL).bin
████ 30%████ OK
Extracting /content/ROM/Seawolf 3 (Submarine Commander Beta) (03-23-1981) (Sears Tele-Games, Marilyn Churchill, Matthew L. Hubbard) (CX2647 - 49-7514 2) (Prototype) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Secret Agent (Paddle) (1983) (Data Age) (Prototype) ~.bin █████ 30%████ OK
Extracting /content/ROM/Secret Quest (1989) (Atari - Axlon, Steve DeFrisco) (CX26170) ~.bin █████ 30%████ OK
Extracting /content/ROM/Secret Quest (1989) (Atari - Axlon, Steve DeFrisco) (CX26170, CX26170P) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/See Saw (AKA Circus Atari) (Double-Game Package) (1983) (Otto Versand) (649635) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Sentinel (Light Gun) (1991) (Atari - Imagineering, David Lubar) (CX26183) ~.bin █████ 30%████ OK
Extracting /content/ROM/Shark Attack (AKA Lochjaw) (1982) (Apollo - Games by Apollo, Steve Stringfellow) (AP-2005) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Shark Attack (AKA Lochjaw) (1982) (Apollo - Games by Apollo, Steve Stringfellow) (AP-2005).bin █████ 30%████ OK
Extracting /content/ROM/Shootin' Gallery (1983) (Imagic, Dennis Koble) (720 021-1A, IA3410) ~.bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (01-16-1990) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) (PAL).bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) [screen 2].bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) [screen 3].bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) [screen 4].bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) [screen 5].bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) [screen 6].bin █████ 30%████ OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (03-07-1989) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototyp

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e).bin      30%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
[screen 2].bin      30%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
[screen 3].bin      31%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
[screen 4].bin      31%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
[screen 5].bin      31%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
[screen 6].bin      31%      OK
Extracting /content/ROM/Shooting Arcade (Light Gun) (09-19-1989) (Atari - A
xlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype)
~.bin      31%      OK
Extracting /content/ROM/Shuttle Orbiter (1983) (Avalon Hill, Jean Baer, Bil
l Hood) (5004002) ~.bin      31%      OK
Extracting /content/ROM/Sinistar (01-04-1984) (Atari, Lou Harp) (CX26122)
(Prototype).bin      31%      OK
Extracting /content/ROM/Sinistar (01-23-1984) (Atari, Lou Harp) (CX26122)
(Prototype).bin      31%      OK
Extracting /content/ROM/Sinistar (01-XX-1984) (Atari, Lou Harp) (CX26122)
(Prototype).bin      31%      OK
Extracting /content/ROM/Sinistar (02-13-1984) (Atari, Lou Harp) (CX26122)
(Prototype) ~.bin      31%      OK
Extracting /content/ROM/Sir Lancelot (1983) (Xonox - K-Tel Software - Produ
ct Guild, Anthony R. Henderson) (99006, 6220) (PAL).bin      31%      O
K
Extracting /content/ROM/Sir Lancelot (1983) (Xonox - K-Tel Software - Produ
ct Guild, Anthony R. Henderson) (99006, 6220) ~.bin      31%      OK
Extracting /content/ROM/Skate Boardin' (1987) (Absolute Entertainment, Davi
d Crane) (AG-042-02, AG-042-04) ~.bin      31%      OK
Extracting /content/ROM/Skate Boardin' (1987) (Absolute Entertainment, Davi
d Crane) (EAZ-042-04B, EAZ-042-04I) (PAL).bin      31%      OK
Extracting /content/ROM/Skeet Shoot (1981) (Apollo - Games by Apollo, Ed Sa
lvo) (AP-1001) (PAL) (4K).bin      31%      OK
Extracting /content/ROM/Skeet Shoot (1981) (Apollo - Games by Apollo, Ed Sa
lvo) (AP-1001) ~.bin      31%      OK
Extracting /content/ROM/Ski Hunt (Skiing Hunt) (1983) (Home Vision, R.J.P.
G. - Gem International Corporation - VDI) (VCS83106) (PAL) ~.bin      3
1%      OK
Extracting /content/ROM/Ski Run (AKA Crazy Ski) (1983) (Suntek) (SS-024) (P
AL).bin      31%      OK
Extracting /content/ROM/Ski Run (AKA Crazy Ski) (Video Game Cartridge - Ari
ola) (TP-607) (PAL).bin      31%      OK
Extracting /content/ROM/Skiing (2600 Screen Search Console) (Jone Yuan Tele
phonic Enterprise Co).bin      31%      OK
Extracting /content/ROM/Skiing (32 in 1) (1988) (Atari) (CX26163P) (PAL).bi
n      31%      OK
Extracting /content/ROM/Skiing (Dactari - Milmar).bin
31%      OK
Extracting /content/ROM/Skiing (Unknown) (PAL) (4K).bin

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0000 31%000000 OK
Extracting /content/ROM/Skiing (Unknown) (PAL).bin
0000 31%000000 OK
Extracting /content/ROM/Skiing - Le Ski (1980) (Activision, Bob Whitehead)
(AG-005, CAG-005, AG-005-04) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Skiing - Ski Weltcup (1980) (Activision, Bob Whiteh
ead - Ariola) (EAG-005, PAG-005, EAG-005-04B - 711 005-715) (PAL).bin
0000 31%000000 OK
Extracting /content/ROM/Skindiver (1983) (Sancho - Tang's Electronic Co.)
(TEC003) (PAL) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Sky Alien (Hack) (32 in 1) (Bit Corporation) (R32
0).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Alien (Sky Aliem) (1983) (Home Vision - Gem Int
ernational Corporation - VDI) (VCS83112) (PAL) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Sky Diver (1979) (Atari, Jim Huether) (CX2629, CX26
29P) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Diver (32 in 1) (1988) (Atari, Jim Huether) (CX
26163P) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Diver (Hack) (2600 Screen Search Console) (Jone
Yuan Telephonic Enterprise Co).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Diver (Hack) (Unknown) (PAL).bin
0000 31%000000 OK
Extracting /content/ROM/Sky Diver - Dare Diver (1979) (Atari, Jim Huether -
Sears) (CX2629 - 6-99843, 49-75118) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Sky Jinks (1982) (Activision, Bob Whitehead) (AG-01
9) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Sky Jinks (CCE).bin
0000 31%000000 OK
Extracting /content/ROM/Sky Jinks (Hack) (Unknown) (PAL).bin
0000 31%000000 OK
Extracting /content/ROM/Sky Jinks - Wettflug gegen die Zeit (1982) (Activis
ion, Bob Whitehead - Ariola) (EAG-019, EAG-019-04I - 711 019-715) (PAL).bin
0000 31%000000 OK
Extracting /content/ROM/Sky Patrol (Aerial Ace) (1982) (Imagic, Brad Stewar
t) (720106-1A, IA3409) (Prototype) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Sky Scraper (AKA Base Attack) (1983) (Goliath - Hot
Shot) (83-415) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Skipper (1983) (Parker Brothers) (931510) (PA
L).bin 0000 31%000000 OK
Extracting /content/ROM/Sky Skipper (1983) (Parker Brothers) (PB5350) ~.bin
0000 31%000000 OK
Extracting /content/ROM/Skydiver (AKA Parachute) (1983) (Suntek) (SS-030)
(PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Slot Machine (1979) (Atari, David Crane) (CX2653P)
(PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Slot Machine (32 in 1) (1988) (Atari, David Crane)
(CX26163P) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Slot Machine (Unknown) (PAL) (4K).bin
0000 31%000000 OK
Extracting /content/ROM/Slot Machine - Slots (1979) (Atari, David Crane - S
ears) (CX2653 - 6-99823, 49-75111) ~.bin 0000 31%000000 OK
Extracting /content/ROM/Slot Racers (1978) (Atari, Warren Robinett) (CX260
6, CX2606P) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Slot Racers (32 in 1) (1988) (Atari, Warren Robinet
t) (CX26163P) (PAL).bin 0000 31%000000 OK
Extracting /content/ROM/Slot Racers - Maze (1978) (Atari, Warren Robinett -

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Sears) (CX2606 - 6-99825, 49-75112) ~.bin      31% OK
Extracting /content/ROM/Smash Hit Pak - Frogger, Boxing, Sequest, Skiing,
Stampede (HES) (498) (PAL).bin      31% OK
Extracting /content/ROM/Smurf - Rescue in Gargamel's Castle (Smurf, Smurf A
ction) (1983) (Coleco - JWDA, Todd Marshall, Robin McDaniel, Henry Will IV)
(2465) (Prototype).bin      31% OK
Extracting /content/ROM/Smurf - Rescue in Gargamel's Castle (Smurf, Smurf A
ction) (1983) (Coleco - JWDA, Todd Marshall, Robin McDaniel, Henry Will IV)
(2465) ~.bin      31% OK
Extracting /content/ROM/Smurf - Schtroumpfs - Pitufo (1983) (CBS Electronic
s - JWDA, Todd Marshall, Robin McDaniel, Henry Will IV) (4L1767, 4L1768, 4L1
769, 4L1770) (PAL).bin      31% OK
Extracting /content/ROM/Smurfs Save the Day (Kid Vid Voice Module) (1983)
(Coleco, Rob Harris) (2511) ~.bin      31% OK
Extracting /content/ROM/Snail Against Squirrel (1983) (Bit Corporation) (PG
208).bin      31% OK
Extracting /content/ROM/Snail Against Squirrel (Unknown) (PAL) [a].bin
31% OK
Extracting /content/ROM/Snail Against Squirrel (Unknown) (PAL).bin
32% OK
Extracting /content/ROM/Snail Against Squirrel - Schnecke gegen Eichhoernch
en (1983) (Bit Corporation) (PG208) (PAL) ~.bin      32% OK
Extracting /content/ROM/Sneak 'n Peek (Hide 'n Seek) (1982) (U.S. Games Cor
poration - Vidtec - JWDA, Garry Kitchen, Paul Willson) (VC1002) ~.bin
32% OK
Extracting /content/ROM/Sneak 'n Peek (Unknown) (PAL).bin
32% OK
Extracting /content/ROM/Sneak 'n Peek - Der Unsichtbare (1983) (Carrere Vid
eo - JWDA, Garry Kitchen, Paul Willson - Teldec - Prism) (USC1002) (PAL).bin
32% OK
Extracting /content/ROM/Snoopy (AKA Snoopy and the Red Baron) (Digivision).
bin      32% OK
Extracting /content/ROM/Snoopy and the Red Baron (05-27-1983) (Atari, Ed Bo
gas, Sam Comstock, Richard Dobbis, Nick 'Sandy Maiwald' Turner) (CX26111) (P
rototype).bin      32% OK
Extracting /content/ROM/Snoopy and the Red Baron (1983) (Atari, Ed Bogas, S
am Comstock, Richard Dobbis, Nick 'Sandy Maiwald' Turner) (CX26111) (PAL).bi
n      32% OK
Extracting /content/ROM/Snoopy and the Red Baron (1983) (Atari, Ed Bogas, S
am Comstock, Richard Dobbis, Nick 'Sandy Maiwald' Turner) (CX26111) ~.bin
32% OK
Extracting /content/ROM/Snoopy and the Red Baron (Canal 3 - Intellivision)
(C 3007).bin      32% OK
Extracting /content/ROM/Snoopy and the Red Baron (CCE).bin
32% OK
Extracting /content/ROM/Snow Hunter (AKA Ski Hunt) (4 Game in One) (1983)
(Bit Corporation) (CP405) (PAL).bin      32% OK
Extracting /content/ROM/Snow White (02-09-1983) (Atari, Greg Easter, Mimi N
yden) (CX26107) (Prototype) ~.bin      32% OK
Extracting /content/ROM/Snow White (11-09-1982) (Atari, Greg Easter, Mimi N
yden) (CX26107) (Prototype).bin      32% OK
Extracting /content/ROM/Soccer (AKA International Soccer) (1988) (Telegame
s) (5687 A279).bin      32% OK
Extracting /content/ROM/Solar Fox (1983) (CBS Electronics, Bob Curtiss) (4L
2487 5000) (Prototype) (4K).bin      32% OK
Extracting /content/ROM/Solar Fox (1983) (CBS Electronics, Bob Curtiss) (4L

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2487 5000) ~.bin      32%      OK
Extracting /content/ROM/Solar Fox (1983) (CBS Electronics, Bob Curtiss) (4L
1852, 4L1853, 4L1854, 4L1855) (PAL).bin      32%      OK
Extracting /content/ROM/Solar Fox (Unknown) (PAL).bin
32%      OK
Extracting /content/ROM/Solar Storm (Paddle) (1983) (Imagic, Wilfredo Aguil
ar, Michael Becker, Dennis Koble) (720113-1A, 03206) ~.bin      32%      OK
Extracting /content/ROM/Solar Storm (Paddle) (1983) (Imagic, Wilfredo Aguil
ar, Michael Becker, Dennis Koble) (720113-2A, 13206) (PAL).bin      3
2%      OK
Extracting /content/ROM/Solar Storm (Paddle) (Canal 3 - Intellivision).bin
32%      OK
Extracting /content/ROM/Solaris (The Last Starfighter, Star Raiders II, Uni
verse) (1986) (Atari, Douglas Neubauer, Mimi Nyden) (CX26136) (PAL).bin
32%      OK
Extracting /content/ROM/Solaris (The Last Starfighter, Star Raiders II, Uni
verse) (1986) (Atari, Douglas Neubauer, Mimi Nyden) (CX26136) (Prototype).bi
n      32%      OK
Extracting /content/ROM/Solaris (The Last Starfighter, Star Raiders II, Uni
verse) (1986) (Atari, Douglas Neubauer, Mimi Nyden) (CX26136) ~.bin      32%      OK
Extracting /content/ROM/Sorcerer (1983) (Mythicon, Bill Bryner, Bruce de Gr
aaf) (MA1001) ~.bin      32%      OK
Extracting /content/ROM/Sorcerer's Apprentice (1983) (Atari, Dave Joly, Pet
er C. Niday, Robert Vieira) (CX26109) (PAL).bin      32%      OK
Extracting /content/ROM/Sorcerer's Apprentice (1983) (Atari, Dave Joly, Pet
er C. Niday, Robert Vieira) (CX26109) (Prototype) [a].bin      32%      OK
Extracting /content/ROM/Sorcerer's Apprentice (1983) (Atari, Dave Joly, Pet
er C. Niday, Robert Vieira) (CX26109) (Prototype).bin      32%      OK
Extracting /content/ROM/Sorcerer's Apprentice (1983) (Atari, Dave Joly, Pet
er C. Niday, Robert Vieira) (CX26109) ~.bin      32%      OK
Extracting /content/ROM/Space Adventure (AKA Flash Gordon) (Zellers).bin
32%      OK
Extracting /content/ROM/Space Attack (1982) (M Network - INTV - Aph Technol
ogical Consulting, Hal Finney, Bruce Pedersen) (MT5659) ~.bin      3
2%      OK
Extracting /content/ROM/Space Attack (1988) (Telegames) (PAL).bin
32%      OK
Extracting /content/ROM/Space Canyon (AKA Space Cavern) (1983) (Panda) (10
0).bin      32%      OK
Extracting /content/ROM/Space Cavern (1982) (Apollo - Games by Apollo, Dan
Oliver) (AP-2002) ~.bin      32%      OK
Extracting /content/ROM/Space Cavern - Les guerriers de l'espace (1982) (Ap
ollo - Games by Apollo, Dan Oliver - RCA Video Jeux) (AP-2002) (PAL).bin
32%      OK
Extracting /content/ROM/Space Eagle (AKA Exocet) (1983) (Goliath - Hot Sho
t) (83-213) (PAL).bin      32%      OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer - Sear
s) (CX2632 - 49-75153) ~.bin      32%      OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX26
32, CX2632P) (PAL) [different speed and colors].bin      32%      OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX26
32, CX2632P) (PAL) [fixed].bin      32%      OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX26

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32, CX2632P) (PAL).bin      0000 32%000000 OK
Extracting /content/ROM/Space Invaders (Hack) (32 in 1) (Bit Corporation)
(R320).bin      0000 32%000000 OK
Extracting /content/ROM/Space Jockey (1982) (U.S. Games Corporation - Vidte
c - JWDA, Garry Kitchen) (VC1001) ~.bin      0000 32%000000 OK
Extracting /content/ROM/Space Jockey (1983) (Carrere Video - JWDA, Garry Ki
tchen - Teldec - Prism) (USC1001) (PAL).bin      0000 32%000000 OK
Extracting /content/ROM/Space Jockey (Unknown) (PAL) [a].bin
0000 33%000000 OK
Extracting /content/ROM/Space Jockey (Unknown) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Jockey (Unknown).bin
0000 33%000000 OK
Extracting /content/ROM/Space Monster (AKA Condor Attack) (1982) (Funvision
- Fund. International Co.) (F2001) (PAL).bin      0000 33%000000 OK
Extracting /content/ROM/Space Raid (AKA MegaMania) (1983) (Rainbow Vision -
Suntek) (SS-007) (PAL).bin      0000 33%000000 OK
Extracting /content/ROM/Space Raid (AKA MegaMania) (2600 Screen Search Cons
ole) (Jones Yuan Telephonic Enterprise Co).bin      0000 33%000000 OK
Extracting /content/ROM/Space Raid (AKA MegaMania) (Unknown) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Robot (1983) (Goliath) (1) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Robot (Dimax - Sinmax) (SM8001) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Robot (Dimax - Sinmax) (SM8001).bin
0000 33%000000 OK
Extracting /content/ROM/Space Robot (Unknown) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Robot (Unknown).bin
0000 33%000000 OK
Extracting /content/ROM/Space Shuttle - A Journey Into Space (1983) (Activi
sion - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen) (AZ-033,
AZ-033-04) [FE bankswitching] ~.bin      0000 33%000000 OK
Extracting /content/ROM/Space Shuttle - A Journey Into Space (1983) (Activi
sion - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen) (AZ-033,
AZ-033-04) ~.bin      0000 33%000000 OK
Extracting /content/ROM/Space Shuttle - A Journey Into Space (1983) (Activi
sion - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen) (EAS-03
3) (SECAM).bin      0000 33%000000 OK
Extracting /content/ROM/Space Shuttle - A Journey Into Space - Eine Reise i
ns All (1983) (Activision - Woodside Design Associates, Steve 'Jessica Steve
ns' Kitchen - Ariola) (EAS-033 - 711 033-725) (PAL).bin      0000 33%000000 O
K
Extracting /content/ROM/Space Tunnel (1982) (Bit Corporation) (PG202).bin
0000 33%000000 OK
Extracting /content/ROM/Space Tunnel (1982) (Puzzy - Bit Corporation) (PG20
2) (PAL).bin      0000 33%000000 OK
Extracting /content/ROM/Space Tunnel (1983) (Goliath) (7) (PAL).bin
0000 33%000000 OK
Extracting /content/ROM/Space Tunnel - Le Tunnel de L'Estate (1982) (Puzzy
- Bit Corporation) (PG202).bin      0000 33%000000 OK
Extracting /content/ROM/Space Tunnel - O Túnel Espacial (1983) (CCE) (C-80
7).bin      0000 33%000000 OK
Extracting /content/ROM/Space Tunnel - Weltraum-Tunnel (1982) (Bit Corporat
ion) (PG202) (PAL) ~.bin      0000 33%000000 OK

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Extracting /content/ROM/Space War (1978) (Atari, Ian Shepard) (CX2604, CX26
04P) (PAL).bin      33%  OK
Extracting /content/ROM/Space War (Unknown) (PAL) (4K).bin
33%  OK
Extracting /content/ROM/Space War (Unknown) (PAL).bin
33%  OK
Extracting /content/ROM/Space War - Space Combat (1978) (Atari, Ian Shepard
- Sears) (CX2604 - 6-99812, 49-75106) ~.bin      33%  OK
Extracting /content/ROM/Space War - Space Star (32 in 1) (1988) (Atari, Ian
Shepard) (CX26163P) (PAL).bin      33%  OK
Extracting /content/ROM/Spacechase (Space Attack) (1982) (Apollo - Games by
Apollo, Ed Salvo, Byron Parks) (AP-2001) (PAL).bin      33%  OK
Extracting /content/ROM/Spacechase (Space Attack) (1982) (Apollo - Games by
Apollo, Ed Salvo, Byron Parks) (AP-2001) ~.bin      33%  OK
Extracting /content/ROM/SpaceMaster X-7 (1983) (20th Century Fox Video Game
s - Sirius Software, David Lubar) (11022) ~.bin      33%  OK
Extracting /content/ROM/SpaceMaster X-7 (Hack) (32 in 1) (Bit Corporation)
(R320).bin      33%  OK
Extracting /content/ROM/SpaceMaster X-7 (Unknown) (PAL).bin
33%  OK
Extracting /content/ROM/Spectracube Invasion (AKA Immies & Aggies) (1983)
(Suntek) (SS-025) (PAL).bin      33%  OK
Extracting /content/ROM/Spider Fighter (1983) (Activision, Larry Miller) (A
X-021) ~.bin      33%  OK
Extracting /content/ROM/Spider Fighter (1983) (Dynacom).bin
33%  OK
Extracting /content/ROM/Spider Fighter (Canal 3 - Intellivision).bin
33%  OK
Extracting /content/ROM/Spider Fighter (Digivision).bin
33%  OK
Extracting /content/ROM/Spider Fighter (Hack) (32 in 1) (Bit Corporation)
(R320).bin      33%  OK
Extracting /content/ROM/Spider Fighter (Unknown) (PAL).bin
33%  OK
Extracting /content/ROM/Spider Fighter (Unknown).bin
33%  OK
Extracting /content/ROM/Spider Fighter - Monster greifen an (1983) (Activis
ion, Larry Miller - Ariola) (EAX-021, EAX-021-04I - 711 021-720) (PAL).bin
33%  OK
Extracting /content/ROM/Spider Kong (AKA Inca Gold) (1983) (Goliath) (6) (P
AL) [a].bin      33%  OK
Extracting /content/ROM/Spider Kong (AKA Inca Gold) (1983) (Goliath) (6) (P
AL).bin      33%  OK
Extracting /content/ROM/Spider Maze (AKA Inca Gold) (1982) (K-Tel Vision)
(PAL).bin      33%  OK
Extracting /content/ROM/Spider Maze (AKA Inca Gold) (1982) (K-Tel Vision).b
in      33%  OK
Extracting /content/ROM/Spider Monster - Inca Gold (1982) (Funvision - Fun
d. International Co.) (PAL) ~.bin      33%  OK
Extracting /content/ROM/Spider-Man (1982) (Parker Brothers, David Lamkins,
Laura Nikolich) (931503) (PAL).bin      33%  OK
Extracting /content/ROM/Spider-Man (1982) (Parker Brothers, David Lamkins,
Laura Nikolich) (PB5900) ~.bin      33%  OK
Extracting /content/ROM/Spider-Man (Unknown) (PAL).bin
33%  OK
Extracting /content/ROM/Spiderdroid (AKA Amidar) (1987) (Froggo) (FG1002).b

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in      33%      OK
Extracting /content/ROM/Spiderman (AKA Spider-Man) (1983) (Quelle) (495.663
7) (PAL).bin      33%      OK
Extracting /content/ROM/Spike's Peak (1983) (Xonox - K-Tel Software - Beck-
Tech, Steve Beck) (6210, 7210, 06003. 99001) (PAL).bin      33%      OK
Extracting /content/ROM/Spike's Peak (1983) (Xonox - K-Tel Software - Beck-
Tech, Steve Beck) (6210, 7210, 06003. 99001) ~.bin      33%      OK
Extracting /content/ROM/Spinning Fireball (Unknown) (PAL).bin
33%      OK
Extracting /content/ROM/Spinning Fireball (Unknown).bin
33%      OK
Extracting /content/ROM/Spinning Fireball - Fire Spinner - Fireball Spinner
(1983) (ZiMAG - Emag - Vidco) (GN-080) (Prototype) ~.bin      33%      OK
Extracting /content/ROM/Spitfire Attack (Flight Commander) (1983) (Milton B
radley Company - Video Soft, Frank Ellis) (4363) ~.bin      33%      OK
Extracting /content/ROM/Sports Action Pak - Enduro, Ice Hockey, Fishing Der
by, Dragster (1988) (HES - Activision) (PAL).bin      33%      OK
Extracting /content/ROM/Springer (1983) (Tigervision - Software Electronics
Corporation - Teldec - Prism) (7-006 - 3.60008 VG) (PAL).bin      3
3%      OK
Extracting /content/ROM/Springer (1983) (Tigervision - Software Electronics
Corporation) (7-006) ~.bin      34%      OK
Extracting /content/ROM/Sprint Master (Sprint 88, Sprint 2600) (1988) (Atar
i - Bobco, Robert C. Polaro) (CX26155) ~.bin      34%      OK
Extracting /content/ROM/Sprint Master (Sprint 88, Sprint 2600) (1988) (Atar
i - Bobco, Robert C. Polaro) (CX26155P) (PAL).bin      34%      OK
Extracting /content/ROM/Spy Hunter (Dual Control Module) (1984) (SEGA, Jeff
Lorenz) (011-01, 011-02) ~.bin      34%      OK
Extracting /content/ROM/Spy Vs. Spy (AKA Chopper Command) (4 Game in One)
(1983) (Bit Corporation) (PGP213) (PAL).bin      34%      OK
Extracting /content/ROM/Squeeze Box (1983) (U.S. Games Corporation - JWDA,
Todd Marshall, Robin McDaniel, Henry Will IV) (VC2002) ~.bin      3
4%      OK
Extracting /content/ROM/Squirrel - 0 Esquilo (AKA Snail Against Squirrel)
(1983) (CCE) (C-809).bin      34%      OK
Extracting /content/ROM/Squoosh (Vat's Incredible!, The Grape Escape) (198
3) (Apollo) (AP-2012) (Prototype) [a].bin      34%      OK
Extracting /content/ROM/Squoosh (Vat's Incredible!, The Grape Escape) (198
3) (Apollo) (AP-2012) (Prototype) ~.bin      34%      OK
Extracting /content/ROM/Sssnake (1982) (Data Age) (DA1003) ~.bin
34%      OK
Extracting /content/ROM/Sssnake (1983) (Gameworld) (133-003) (PAL).bin
34%      OK
Extracting /content/ROM/Stampede (1981) (Activision, Bob Whitehead) (AG-01
1) ~.bin      34%      OK
Extracting /content/ROM/Stampede (2600 Screen Search Console) (Jones Yuan Te
lephonic Enterprise Co).bin      34%      OK
Extracting /content/ROM/Stampede (32 in 1) (1988) (Atari) (CX26163P) (PAL).
bin      34%      OK
Extracting /content/ROM/Stampede (Canal 3 - Intellivision).bin
34%      OK
Extracting /content/ROM/Stampede (Hack) (2600 Screen Search Console) (Jones
Yuan Telephonic Enterprise Co).bin      34%      OK
Extracting /content/ROM/Stampede (Unknown) (PAL) (4K).bin
34%      OK

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Extracting /content/ROM/Stampede (Unknown) (PAL).bin
████ 34%████ OK
Extracting /content/ROM/Stampede (Unknown).bin
████ 34%████ OK
Extracting /content/ROM/Stampede - Lasso-Helden (1981) (Activision, Bob Whitehead - Ariola) (EAG-011, PAG-011 - 711 011-715) (PAL).bin █████ 3
4%████ OK
Extracting /content/ROM/Star Fox (1983) (Mythicon, Bill Bryner, Bruce de Graaf) (MA1003) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Raiders (1981) (Atari, Carla Meninsky - Sears) (CX2660 - 49-75187) (Prototype) (4K).bin █████ 34%████ OK
Extracting /content/ROM/Star Raiders (Video Touch Pad) (1982) (Atari, Carla Meninsky - Sears) (CX2660 - 49-75187) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Raiders (Video Touch Pad) (1982) (Atari, Carla Meninsky) (CX2660) (PAL).bin █████ 34%████ OK
Extracting /content/ROM/Star Ship - Outer Space (Star Trek, Space, Space Mission) (1977) (Atari, Bob Whitehead - Sears) (CX2603 - 99803, 49-75601) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Strike (1983) (M Network - INTV, David Akers, Patricia Lewis Du Long) (MT4313) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Strike (1988) (Telegames) (PAL).bin
████ 34%████ OK
Extracting /content/ROM/Star Trek (Unknown) (PAL).bin
████ 34%████ OK
Extracting /content/ROM/Star Trek - Strategic Operations Simulator (1983) (SEGA, Jeff Lorenz - Teldec) (004-01 - 3.60103 VG) (PAL).bin █████ 3
4%████ OK
Extracting /content/ROM/Star Trek - Strategic Operations Simulator (1983) (SEGA, Jeff Lorenz) (004-01) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Voyager (1982) (Imagic, Bob Smith) (720000-201, 720102-1B, IA3201) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Voyager (1982) (Imagic, Bob Smith) (720102-2B, IA3201P, EIX-011-04I) (PAL).bin █████ 34%████ OK
Extracting /content/ROM/Star Voyager (1983) (CCE) (C-818) [a].bin
████ 34%████ OK
Extracting /content/ROM/Star Voyager (1983) (CCE) (C-818).bin
████ 34%████ OK
Extracting /content/ROM/Star Voyager (Unknown) (PAL).bin
████ 34%████ OK
Extracting /content/ROM/Star Wars - Jedi Arena (Paddle) (1983) (Parker Brothers, Rex Bradford) (931507) (PAL).bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Jedi Arena (Paddle) (1983) (Parker Brothers, Rex Bradford) (PB5000) (Prototype).bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Jedi Arena (Paddle) (1983) (Parker Brothers, Rex Bradford) (PB5000) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Death Star Battle (Revenge of the Jedi - Game II) (1983) (Parker Brothers - JWDA, Todd Marshall, Robin McDaniel, Ray Miller) (931513) (PAL).bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Death Star Battle (Revenge of the Jedi - Game II) (1983) (Parker Brothers - JWDA, Todd Marshall, Robin McDaniel, Ray Miller) (PB5060) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Ewok Adventure (Revenge of the Jedi - Game I) (05-23-1983) (Parker Brothers, Larry Gelberg) (PB5065) (Prototype) ~.bin █████ 34%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Ewok Adventure (Revenge of the Jedi - Game I) (1983) (Parker Brothers, Larry Gelberg) (PB5065)

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(Prototype) (PAL).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (01-03-1984) (Parker Br
others, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Ste
wart) (PB5540) (Prototype) (4K).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (04-05-1984) (Parker Br
others, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Ste
wart) (PB5540) (Prototype).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (12-05-1983) (Parker Br
others, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Ste
wart) (PB5540) (Prototype) (4K).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (12-15-1983) (Parker Br
others, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Ste
wart) (PB5540) (Prototype) (4K).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (12-23-1983) (Parker Br
others, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Ste
wart) (PB5540) (Prototype) (4K).bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Arcade Game (1984) (Parker Brother
s, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Stewart)
(PB5540) (PAL).bin      0000 34%000000 OK
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s, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Stewart)
(PB5540) (Prototype).bin      0000 34%000000 OK
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s, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Stewart)
(PB5540) ~.bin      0000 34%000000 OK
Extracting /content/ROM/Star Wars - The Empire Strikes Back (1982) (Parker
Brothers, Rex Bradford, Sam Kjellman) (931501) (PAL).bin      0000 34%000000
OK
Extracting /content/ROM/Star Wars - The Empire Strikes Back (1982) (Parker
Brothers, Rex Bradford, Sam Kjellman) (PB5050) ~.bin      0000 35%000000 OK
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hs) (CX26120) (PAL).bin      0000 35%000000 OK
Extracting /content/ROM/Stargate (1984) (Atari, Bill Aspromonte, Andrew Fuc
hs) (CX26120) ~.bin      0000 35%000000 OK
Extracting /content/ROM/Stargunner (1983) (Telesys, Alex Leavens) (1005) (P
AL).bin      0000 35%000000 OK
Extracting /content/ROM/Stargunner (1983) (Telesys, Alex Leavens) (1005) ~.
bin      0000 35%000000 OK
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6) ~.bin      0000 35%000000 OK
Extracting /content/ROM/StarMaster (Unknown) (PAL).bin
0000 35%000000 OK
Extracting /content/ROM/StarMaster - Kommando Galaxis (1982) (Activision, A
lan Miller - Ariola) (EAX-016, PAX-016 - 711 016-725) (PAL) [fixed].bin
0000 35%000000 OK
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lan Miller - Ariola) (EAX-016, PAX-016 - 711 016-725) (PAL).bin      0000 3
5%000000 OK
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n      0000 35%000000 OK
Extracting /content/ROM/Steeplechase (Paddle) (04-15-1980) (Sears Tele-Game
s, Jim Huether) (CX2614 - 49-75126) (Prototype).bin      0000 35%000000 OK
Extracting /content/ROM/Steeplechase (Paddle) (1981) (Sears Tele-Games, Jim
Huether) (CX2614 - 49-75126) ~.bin      0000 35%000000 OK
Extracting /content/ROM/Stellar Track (Stella Trek) (1981) (Sears Tele-Game
s, Robert Zdybel) (CX2619 - 49-75159) ~.bin      0000 35%000000 OK

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Extracting /content/ROM/Sternkrieg (AKA Astrowar) (1983) (Video Game - Ario
 la) (SP-204) (PAL).bin 35% OK
 Extracting /content/ROM/Stone Age (1983) (CCE) (C-840) ~.bin
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 Extracting /content/ROM/Stopp die Gangster (AKA Gangster Alley) (1983) (Que
 lle) (377.943 6) (PAL).bin 35% OK
 Extracting /content/ROM/Strahlen der Teufelsvoegel (AKA Atlantis) (1983) (Q
 uelle) (463.860 7) (PAL).bin 35% OK
 Extracting /content/ROM/Strategy X (1983) (Gakken) (010) (PAL).bin
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 Extracting /content/ROM/Strategy X (1983) (Konami) (RC 101-X 02) ~.bin
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 Extracting /content/ROM/Strawberry Shortcake - Musical Match-Ups (1983) (Pa
 rker Brothers, Dawn Stockbridge) (PB5910) (PAL).bin 35% OK
 Extracting /content/ROM/Strawberry Shortcake - Musical Match-Ups (1983) (Pa
 rker Brothers, Dawn Stockbridge) (PB5910) ~.bin 35% OK
 Extracting /content/ROM/Street Racer (Wheels) (Paddle) (1977) (Atari, Larry
 Kaplan) (CX2612, CX2612P) (PAL).bin 35% OK
 Extracting /content/ROM/Street Racer - Speedway II (Wheels) (Paddle) (1977)
 (Atari, Larry Kaplan - Sears) (CX2612 - 99804, 49-75103) ~.bin 3
 5% OK
 Extracting /content/ROM/Stronghold (1983) (CommaVid, Joseph Biel) (CM-009)
 ~.bin 35% OK
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 Polaro) (CX26157) (Prototype) ~.bin 35% OK
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 Extracting /content/ROM/Sub-Scan (Unknown) (PAL).bin
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 Games, Marilyn Churchill, Matthew L. Hubbard) (CX2647 - 49-75142) ~.bin
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 Extracting /content/ROM/Submarine Commander (Unknown) (PAL).bin
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 (720112-1A, 03213) ~.bin 35% OK
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 (EIZ-003-04I) (PAL).bin 35% OK
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 ation, Steve Hales, Stephen H. Landrum) (4) (AR-4102) (Prototype).bin
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 ation, Steve Hales, Stephen H. Landrum) (4) (AR-4102) ~.bin 3
 5% OK
 Extracting /content/ROM/Suicide Mission (Meteoroids) (1982) (Starpath Corpo
 ration, Steve Hales, Stephen H. Landrum) (4) (AR-4102) (PAL).bin 3
 5% OK
 Extracting /content/ROM/Suicide Mission (Meteoroids) (Preview) (1982) (Arca
 dia Corporation, Steve Hales, Stephen H. Landrum) (4) (AR-4102).bin 35% OK
 Extracting /content/ROM/Suicide Mission (Meteoroids) (Preview) (1982) (Star
 path Corporation, Steve Hales, Stephen H. Landrum) (4) (AR-4102) (PAL).bin
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e, Peter Engelbrite) (80561-00250) (PAL).bin      35% OK
Extracting /content/ROM/Summer Games (1987) (Epyx, Steven A. Baker, Tod Fry
e, Peter Engelbrite) (80561-00250) ~.bin      35% OK
Extracting /content/ROM/Super Action Pak - Pitfall, Barnstorming, Grand Pri
x, Laser Blast (1988) (HES - Activision) (223) (PAL).bin      35%
OK
Extracting /content/ROM/Super Baseball (1988) (Atari, Mimi Nyden, Joseph Tu
ng) (CX26152) (PAL).bin      35% OK
Extracting /content/ROM/Super Baseball (1988) (Atari, Mimi Nyden, Joseph Tu
ng) (CX26152).bin      35% OK
Extracting /content/ROM/Super Baseball (AKA RealSports Baseball) (CCE).bin
35% OK
Extracting /content/ROM/Super Box (AKA RealSports Boxing) (CCE).bin
35% OK
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Shaw, Nick 'Sandy Maiwald' Turner - Sears) (CX2608 - 49-75165) [a].bin
35% OK
Extracting /content/ROM/Super Breakout (Paddle) (1982 - 1981) (Atari, Carol
Shaw, Nick 'Sandy Maiwald' Turner - Sears) (CX2608 - 49-75165) ~.bin
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Extracting /content/ROM/Super Breakout (Paddle) (1982 - 1981) (Atari, Carol
Shaw, Nick 'Sandy Maiwald' Turner) (CX2608) (PAL).bin      35% OK
Extracting /content/ROM/Super Challenge Baseball (Hack) (32 in 1) (Bit Corp
oration) (R320).bin      35% OK
Extracting /content/ROM/Super Challenge Baseball (Unknown) (PAL) [a].bin
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Extracting /content/ROM/Super Challenge Baseball (Unknown) (PAL).bin
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Extracting /content/ROM/Super Challenge Baseball - Baseball (Big League Bas
eball) (1982) (M Network - INTV - APH Technological Consulting, David Rolfe)
(MT5665) ~.bin      36% OK
Extracting /content/ROM/Super Challenge Football - Football (Pro Football)
(1982) (M Network - INTV - APH Technological Consulting, Ken Smith) (MT5658)
~.bin      36% OK
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Crowley, Bob Curtiss) (931505) (PAL).bin      36% OK
Extracting /content/ROM/Super Cobra (1983) (Parker Brothers - Roklan, Paul
Crowley, Bob Curtiss) (PB5320) ~.bin      36% OK
Extracting /content/ROM/Super Cobra (1983) (Parker Brothers, Mike Brodie)
(PB5320) (Prototype).bin      36% OK
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Suntek) (SS-011) (PAL).bin      36% OK
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26154) ~.bin      36% OK
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26154, CX26154P) (PAL).bin      36% OK
Extracting /content/ROM/Super Futebol (AKA RealSports Football) (CCE).bin
36% OK
Extracting /content/ROM/Super Futebol (AKA RealSports Soccer) (CCE).bin
36% OK
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Fishing Derby, Checkers (HES - Activision) (PAL).bin      36% OK
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Robert Weatherby) (6230, 6250) (PAL).bin      36% OK
Extracting /content/ROM/Super Soccer (AKA RealSports Soccer) (Digivision).b
in      36% OK

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Extracting /content/ROM/Super Tennis (AKA RealSports Tennis) (VGS).bin
████ 36%████ OK
Extracting /content/ROM/Super Tennis (AKA RealSports Tennis) (1983) (CCE)
(C-1005).bin █████ 36%████ OK
Extracting /content/ROM/Super Tennis (AKA RealSports Tennis) (1983) (Tron).
bin █████ 36%████ OK
Extracting /content/ROM/Super Volleyball (AKA RealSports Volleyball) (CCE).b
in █████ 36%████ OK
Extracting /content/ROM/Super-Cowboy beim Rodeo (AKA Stampede) (1983) (Quel
le) (874.254 6) (PAL).bin █████ 36%████ OK
Extracting /content/ROM/Super-Ferrari (AKA Enduro) (1983) (Quelle) (402.272
9) (PAL).bin █████ 36%████ OK
Extracting /content/ROM/Super-Ferrari (AKA Enduro) (2600 Screen Search Cons
ole) (Jone Yuan Telephonic Enterprise Co).bin █████ 36%████ OK
Extracting /content/ROM/Super-Ferrari (AKA Enduro) (Unknown).bin
████ 36%████ OK
Extracting /content/ROM/Supercharger BIOS (1982) (Arcadia Corporation) (PA
L).bin █████ 36%████ OK
Extracting /content/ROM/Supercharger BIOS (1982) (Arcadia Corporation) ~.bi
n █████ 36%████ OK
Extracting /content/ROM/Superman (1979) (Atari, John Dunn - Sears) (CX2631
- 49-75152) [fixed] ~.bin █████ 36%████ OK
Extracting /content/ROM/Superman (1979) (Atari, John Dunn - Sears) (CX2631
- 49-75152) ~.bin █████ 36%████ OK
Extracting /content/ROM/Superman (1979) (Atari, John Dunn) (CX2631, CX2631
P) (PAL).bin █████ 36%████ OK
Extracting /content/ROM/Superman (Unknown) (PAL).bin
████ 36%████ OK
Extracting /content/ROM/Surf's Up (Joyboard) (1983) (Amiga - Video Soft, Ch
ip Curry) (3125) (Prototype) [a1].bin █████ 36%████ OK
Extracting /content/ROM/Surf's Up (Joyboard) (1983) (Amiga - Video Soft, Ch
ip Curry) (3125) (Prototype) [a2].bin █████ 36%████ OK
Extracting /content/ROM/Surf's Up (Joyboard) (1983) (Amiga - Video Soft, Ch
ip Curry) (3125) (Prototype) ~.bin █████ 36%████ OK
Extracting /content/ROM/Surfer's Paradise - But Danger Below! (1983) (Video
Gems) (VG-02) (PAL) ~.bin █████ 36%████ OK
Extracting /content/ROM/Surround (1977) (Blockade) (Atari, Alan Miller) (CX
2641, CX2641P) (PAL).bin █████ 36%████ OK
Extracting /content/ROM/Surround (32 in 1) (1988) (Atari, Alan Miller) (CX2
6163P) (PAL).bin █████ 36%████ OK
Extracting /content/ROM/Surround (32 in 1) (Bit Corporation) (R320).bin
████ 36%████ OK
Extracting /content/ROM/Surround - Chase (Blockade) (1977) (Atari, Alan Mil
ler - Sears) (CX2641 - 99807, 49-75105) ~.bin █████ 36%████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (1 of 3) (1983) (Star
path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401) (PAL).bin
████ 36%████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (1 of 3) (1983) (Star
path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401).bin █████ 3
6%████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (1983) (Starpath Corp
oration, Steve Mundry, Scott Nelson) (12) (AR-4401) (PAL).bin █████ 3
6%████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (1983) (Starpath Corp
oration, Steve Mundry, Scott Nelson) (12) (AR-4401) ~.bin █████ 36%████
OK

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path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401) (PAL).bin
████ 36%██████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (2 of 3) (1983) (Star
path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401).bin █████ 3
6%██████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (3 of 3) (1983) (Star
path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401) (PAL).bin
████ 36%██████ OK
Extracting /content/ROM/Survival Island (Jungle Raid) (3 of 3) (1983) (Star
path Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401).bin █████ 3
6%██████ OK
Extracting /content/ROM/Survival Run (1983) (Data Age) (Prototype) ~.bin
████ 36%██████ OK
Extracting /content/ROM/Survival Run (Cosmic Commander) (1983) (Milton Brad
ley Company - Renaissance Technology, Ty Roberts) (4362) ~.bin █████ 3
7%██████ OK
Extracting /content/ROM/Sweat! - The Decathlon Game (1 of 3) (Paddle) (198
3) (Starpath Corporation, Stephen H. Landrum, Scott Nelson) (13) (Prototype)
~.bin █████ 37%██████ OK
Extracting /content/ROM/Sweat! - The Decathlon Game (2 of 3) (Paddle) (198
3) (Starpath Corporation, Stephen H. Landrum, Scott Nelson) (13) (Prototyp
e).bin █████ 37%██████ OK
Extracting /content/ROM/Sweat! - The Decathlon Game (3 of 3) (Paddle) (198
3) (Starpath Corporation, Stephen H. Landrum, Scott Nelson) (13) (Prototyp
e).bin █████ 37%██████ OK
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n H. Landrum, Jon Leupp) (11) (AR-4201) (PAL).bin █████ 37%██████ OK
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n H. Landrum, Jon Leupp) (11) (AR-4201) ~.bin █████ 37%██████ OK
Extracting /content/ROM/Swordfight (Sword, Swordfighting) (1983) (Intellivi
sion Productions - M Network, Patricia Lewis Du Long, Stephen Tatsumi) ~.bin
████ 37%██████ OK
Extracting /content/ROM/SwordQuest - EarthWorld (Adventure I, SwordQuest I
- EarthWorld) (1982) (Atari, Dan Hitchens, Mimi Nyden) (CX2656) (PAL).bin
████ 37%██████ OK
Extracting /content/ROM/SwordQuest - EarthWorld (Adventure I, SwordQuest I
- EarthWorld) (1982) (Atari, Dan Hitchens, Mimi Nyden) (CX2656) (Prototype).
bin █████ 37%██████ OK
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- EarthWorld) (1982) (Atari, Dan Hitchens, Mimi Nyden) (CX2656) ~.bin
████ 37%██████ OK
Extracting /content/ROM/SwordQuest - FireWorld (Adventure II, SwordQuest II
- FireWorld) (1983) (Atari, Tod Frye, Mimi Nyden) (CX2657) (PAL).bin
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- FireWorld) (1983) (Atari, Tod Frye, Mimi Nyden) (CX2657) ~.bin █████ 3
7%██████ OK
Extracting /content/ROM/SwordQuest - FireWorld Contest Edition (1984) (Atar
i, Tod Frye, Mimi Nyden) (CX2657).bin █████ 37%██████ OK
Extracting /content/ROM/SwordQuest - WaterWorld (1983) (Atari, Tod Frye) (C
X2671) ~.bin █████ 37%██████ OK
Extracting /content/ROM/Tac-Scan (Canal 3 - Intellivision).bin
████ 37%██████ OK
Extracting /content/ROM/Tac-Scan (Hack) (32 in 1) (Bit Corporation) (R320).
bin █████ 37%██████ OK

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1) ~.bin      37%  OK
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Extracting /content/ROM/Tank Brigade (AKA Phantom Tank) (1983) (Panda) (10
1).bin      37%  OK
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- Emag - Vidco) (707-111 - GN-030).bin      37%  OK
Extracting /content/ROM/Tanks War (AKA Phantom Tank) (1983) (Home Vision -
Gem International Corporation - VDI) (VCS83135) (PAL).bin      37%  OK
Extracting /content/ROM/Tapeworm (1982) (Spectravision - Spectravideo) (SA-
204) (PAL).bin      37%  OK
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204) ~.bin      37%  OK
Extracting /content/ROM/Tapeworm (2600 Screen Search Console) (Jone Yuan Te
lephonic Enterprise Co).bin      37%  OK
Extracting /content/ROM/Tapper (1984) (SEGA - Beck-Tech, Steve Beck) (010-0
1) ~.bin      37%  OK
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ype).bin      37%  OK
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CE) (C-833) [a].bin      37%  OK
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CE) (C-833).bin      37%  OK
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1003).bin      37%  OK
Extracting /content/ROM/Tax Avoiders (1986) (American Videogame - Dunhill E
lectronics, Darrell Wagner, Todd Clark Holm, John Simonds) ~.bin      3
7%  OK
Extracting /content/ROM/Taz (Tazz) (06-15-1983) (Atari, Jerome Domurat, Ste
ve Woita) (CX2699) (Prototype) (PAL).bin      37%  OK
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ve Woita) (CX2699) (Prototype).bin      37%  OK
Extracting /content/ROM/Taz (Tazz) (07-15-1983) (Atari, Jerome Domurat, Ste
ve Woita) (CX2699) (Prototype).bin      37%  OK
Extracting /content/ROM/Taz (Tazz) (1983) (Atari, Jerome Domurat, Steve Woi
ta) (CX2699) (Prototype) [a].bin      37%  OK
Extracting /content/ROM/Taz (Tazz) (1983) (Atari, Jerome Domurat, Steve Woi
ta) (CX2699) (Prototype).bin      37%  OK
Extracting /content/ROM/Taz (Tazz) (1984) (Atari, Jerome Domurat, Steve Woi
ta) (CX2699) ~.bin      37%  OK
Extracting /content/ROM/Teddy Apple (AKA Open, Sesame!) (1983) (Home Vision
- Gem International Corporation - VDI) (VCS83137) (PAL).bin      3
7%  OK
Extracting /content/ROM/Telepathy (Mindlink Controller) (1983) (Atari, Dan
Oliver) (Prototype) ~.bin      37%  OK
Extracting /content/ROM/Teller-Jonglieren! (AKA Dancing Plate) (1983) (Quel
le) (685.996 1) (PAL).bin      37%  OK
Extracting /content/ROM/Tempest (01-05-1984) (Atari, Michael Kosaka) (CX268
7) (Prototype) ~.bin      37%  OK
Extracting /content/ROM/Tennis (1981) (Activision, Alan Miller - Ariola) (E
AG-007, EAG-007-04I, PAG-007 - 711 007-720) (PAL).bin      37%  OK
Extracting /content/ROM/Tennis (1983) (CCE) (C-858) (4K).bin
37%  OK
Extracting /content/ROM/Tennis (2600 Screen Search Console) (Jone Yuan Tele

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phonic Enterprise Co).bin      37%  OK
Extracting /content/ROM/Tennis (32 in 1) (1988) (Atari) (CX26163P) (PAL).bin
37%  OK
Extracting /content/ROM/Tennis (Canal 3 - Intellivision) (4K).bin
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Extracting /content/ROM/Tennis (Dactari - Milmar).bin
37%  OK
Extracting /content/ROM/Tennis (Fotomania).bin
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Extracting /content/ROM/Tennis (Hack) (32 in 1) (Bit Corporation) (R320).bin
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Extracting /content/ROM/Tennis (Hack) (Unknown) (PAL).bin
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Extracting /content/ROM/Tennis (Star Game) (007).bin
37%  OK
Extracting /content/ROM/Tennis (Tennis Game) (AKA Tennis) (1983) (Home Vision - Gem International Corporation - VDI) (VCS83107) (PAL) (4K).bin
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Extracting /content/ROM/Tennis (Unknown) (PAL).bin
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Extracting /content/ROM/Tennis (Zirok).bin
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Extracting /content/ROM/Tennis - Le Tennis (1981) (Activision, Alan Miller) (AG-007, CAG-007) ~.bin
37%  OK
Extracting /content/ROM/Texas Chainsaw Massacre, The (1982) (Wizard Video Games, Bob Davis, Robert H. O'Neil) (Prototype) ~.bin
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Extracting /content/ROM/Texas Chainsaw Massacre, The (1983) (Wizard Video Games - VSS, Ed Salvo) (008) ~.bin
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Extracting /content/ROM/Threshold (1982) (Tigervision, Warren Schwader - Teldec - Prism) (7-003 - 3.60003 VE) (PAL).bin
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Extracting /content/ROM/Threshold (1982) (Tigervision, Warren Schwader) (7-003) (Prototype).bin
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Extracting /content/ROM/Threshold (1982) (Tigervision, Warren Schwader) (7-003) ~.bin
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Extracting /content/ROM/Threshold (Unknown).bin
38%  OK
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38%  OK
Extracting /content/ROM/Thunderground (Hack) (Unknown) (PAL).bin
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Extracting /content/ROM/Thunderground (Hack) (Unknown) [a].bin
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Extracting /content/ROM/Thunderground (Hack) (Unknown).bin
38%  OK
Extracting /content/ROM/Thunderground (Underground) (1983) (SEGA, Jeff Lorenz) (003-01) ~.bin
38%  OK
Extracting /content/ROM/Thwacker (04-09-1984) (Activision, Charlie Heath) (Prototype) ~.bin
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Extracting /content/ROM/Time Machine (AKA Asteroid Fire) (1983) (Goliath - Hot Shot) (83-112) (PAL).bin
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Extracting /content/ROM/Time Pilot (1983) (Coleco - Woodside Design Associates, Harley H. Puthuff Jr.) (2663) ~.bin
38%  OK
Extracting /content/ROM/Time Pilot (1983) (Edu Games - Edu Juegos) (PAL).bin
38%  OK
Extracting /content/ROM/Time Pilot (1983) (Rentacom).bin
38%  OK

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Extracting /content/ROM/Time Race (AKA Space Jockey) (1983) (Goliath - Hot
Shot) (83-212) (PAL).bin      38%  OK
Extracting /content/ROM/Time Race (AKA Space Jockey) (1983) (Rainbow Vision
- Suntek - Sunteck Corporation) (SS-001) (PAL).bin      38%  OK
Extracting /content/ROM/Time Race (AKA Time Warp) (Funvision - Fund. Intern
ational Co.) (PAL).bin      38%  OK
Extracting /content/ROM/Time Warp (1982) (Funvision - Fund. International C
o.) (PAL) ~.bin      38%  OK
Extracting /content/ROM/Time Warp (1983) (CCE) (C-845).bin
38%  OK
Extracting /content/ROM/Time Warp (Unknown) (PAL).bin
38%  OK
Extracting /content/ROM/Time Warp (Unknown).bin
38%  OK
Extracting /content/ROM/Time Warp (Zellers).bin
38%  OK
Extracting /content/ROM/Title Match Pro Wrestling (1987) (Absolute Entertai
nment, Alex DeMeo) (AG-041-04) ~.bin      38%  OK
Extracting /content/ROM/Title Match Pro Wrestling - Pro Wrestling (1987) (A
bsolute Entertainment, Alex DeMeo) (EAZ-041-04I) (PAL).bin      38%  OK
Extracting /content/ROM/Tom Boy (AKA Pitfall!) (1983) (Rainbow Vision - Sun
tek) (SS-005) (PAL).bin      38%  OK
Extracting /content/ROM/Tom Boy (AKA Pitfall!) (Unknown) [a].bin
38%  OK
Extracting /content/ROM/Tom Boy (AKA Pitfall!) (Unknown).bin
38%  OK
Extracting /content/ROM/Tom's Eierjagd (AKA Pumuckl at the Farm House) (198
3) (Quelle) (731.503 9) (PAL).bin      38%  OK
Extracting /content/ROM/Tomarc the Barbarian (Thundarr the Barbarian) (198
3) (99007, 6240) (Xonox - K-Tel Software - Product Guild, Anthony R. Henders
on) ~.bin      38%  OK
Extracting /content/ROM/Tomcat - The F-14 Fighter Simulator (1988) (Absolut
e Entertainment, Dan Kitchen) (AK-046-04) ~.bin      38%  OK
Extracting /content/ROM/Tooth Protectors (1983) (Camelot - DSD, Michael Doh
erty, Clyde Hager - Johnson & Johnson) ~.bin      38%  OK
Extracting /content/ROM/Top Gun - Air Patrol (AKA Air Raiders) (1983) (Quel
le - Otto Versand) (626.502 9 - 746381) (PAL).bin      38%  OK
Extracting /content/ROM/Topy (2600 Screen Search Console) (Jone Yuan Teleph
onic Enterprise Co).bin      38%  OK
Extracting /content/ROM/Towering Inferno (1982) (U.S. Games Corporation - W
estern Technologies, Jeff Corsiglia, Paul Allen Newell, Tom Sloper) (VC1009)
~.bin      38%  OK
Extracting /content/ROM/Towering Inferno (Unknown) (PAL) [a].bin
38%  OK
Extracting /content/ROM/Towering Inferno (Unknown) (PAL).bin
38%  OK
Extracting /content/ROM/Track and Field (Los Angeles 1984 Games) (Track & F
ield Controller) (1984) (Atari - GCC, Jaques Hugon, Seth Lipkin) (CX26125, C
X26127) ~.bin      38%  OK
Extracting /content/ROM/Treasure Below (1983) (Video Gems) (VG-05) (PAL) ~.
bin      38%  OK
Extracting /content/ROM/Treasure Island (AKA Treasure Discovery) (1983) (Su
ntek) (SS-026) (PAL).bin      38%  OK
Extracting /content/ROM/Trick Shot (1982) (Imagic, Dennis Koble) (720000-10
0, 720100-1B, IA3000, IA3000C) ~.bin      38%  OK

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Extracting /content/ROM/Trick Shot (1982) (Imagic, Dennis Koble) (720100-2
B, IA3000P) (PAL).bin      38%  OK
Extracting /content/ROM/Trick Shot (Hack) (32 in 1) (Bit Corporation) (R32
0).bin      38%  OK
Extracting /content/ROM/TRON - Deadly Discs (TRON Joystick) (1983) (M Netwo
rk - INTV - APH Technological Consulting, Jeff Ronne, Brett Stutz) (MT5662)
~.bin      38%  OK
Extracting /content/ROM/Tuby Bird (AKA Dolphin) (1983) (Rainbow Vision - Su
ntek) (SS-020) (PAL).bin   38%  OK
Extracting /content/ROM/Tuby Bird (AKA Dolphin) (Unknown) (PAL).bin
38%  OK
Extracting /content/ROM/Tunnel Runner (Black Box) (1983) (CBS Electronics,
Richard K. Balaska Jr., Andy Frank, Stuart Ross) (4L 2520 5000) (Prototype).
bin      38%  OK
Extracting /content/ROM/Tunnel Runner (Black Box) (1983) (CBS Electronics,
Richard K. Balaska Jr., Andy Frank, Stuart Ross) (4L 2520 5000) ~.bin
38%  OK
Extracting /content/ROM/Turbo (1982) (Coleco - Product Guild - GMA, Michael
Green, Anthony R. Henderson, Gary Littleton) (2455) (Prototype) ~.bin
38%  OK
Extracting /content/ROM/Turmoil (1982) (20th Century Fox Video Games - Siri
us Software, Mark Turmell) (11007) ~.bin      38%  OK
Extracting /content/ROM/Turmoil (Unknown) (PAL).bin
38%  OK
Extracting /content/ROM/Turmoil (Zellers).bin
38%  OK
Extracting /content/ROM/Turtle Race (AKA Freeway) (4 Game in One) (1983) (B
it Corporation) (CP405) (PAL).bin      38%  OK
Extracting /content/ROM/Tutankham (1983) (Parker Brothers, Dave Engman, Daw
n Stockbridge) (931509) (PAL).bin      38%  OK
Extracting /content/ROM/Tutankham (1983) (Parker Brothers, Dave Engman, Daw
n Stockbridge) (PB5340) ~.bin      39%  OK
Extracting /content/ROM/UFI und sein gefaehrlicher Einsatz (AKA Go Go Home)
(1983) (Quelle) (732.174 8) (PAL).bin      39%  OK
Extracting /content/ROM/UFO (AKA Space Jockey) (32 in 1) (1988) (Atari) (CX
26163P) (PAL).bin      39%  OK
Extracting /content/ROM/UFO Patrol (AKA X'Mission) (1983) (Suntek) (SS-031)
(PAL).bin      39%  OK
Extracting /content/ROM/Ungeheuer der Tiefe (AKA Skindiver) (1983) (Quelle)
(719.013 5) (PAL).bin      39%  OK
Extracting /content/ROM/Universal Chaos (AKA Targ) (1988) (Telegames - VSS)
(7062 A305) (PAL).bin      39%  OK
Extracting /content/ROM/Universal Chaos (AKA Targ) (1988) (Telegames - VSS)
(7062 A305) (Prototype).bin      39%  OK
Extracting /content/ROM/Universal Chaos (AKA Targ) (1988) (Telegames - VSS)
(7062 A305) ~.bin      39%  OK
Extracting /content/ROM/Unknown Activision Game (10-22-1982) (Activision)
(Prototype).bin      39%  OK
Extracting /content/ROM/Unknown Activision Game (10-29-1982) (Activision)
(Prototype) ~.bin      39%  OK
Extracting /content/ROM/Unknown Datatech Game (2600 Screen Search Console)
(Jone Yuan Telephonic Enterprise Co) ~.bin      39%  OK
Extracting /content/ROM/Up 'n Down (1984) (SEGA - Beck-Tech, Steve Beck, Ph
at Ho) (009-01) ~.bin      39%  OK
Extracting /content/ROM/Vanguard (1982) (Atari - GCC, Dave Payne) (CX2669)
(Prototype).bin      39%  OK

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Extracting /content/ROM/Vanguard (1983) (Atari - GCC, Dave Payne) (CX2669)
~.bin      39%  OK
Extracting /content/ROM/Vanguard (1983) (Atari - GCC, Dave Payne) (CX2669,
CX2669P) (PAL).bin      39%  OK
Extracting /content/ROM/Vanguard (CCE).bin
39%  OK
Extracting /content/ROM/Vanguard (Rentacom).bin
39%  OK
Extracting /content/ROM/Vanguard (Unknown) (PAL).bin
39%  OK
Extracting /content/ROM/Vanguard (VGS).bin
39%  OK
Extracting /content/ROM/VCS Draw Demo (Joe Gaucher) ~.bin
39%  OK
Extracting /content/ROM/Venetian Blinds Demo (1981) (Activision, David Cran
e, Bob Whitehead) ~.bin      39%  OK
Extracting /content/ROM/Venture (1982) (Coleco, Joseph Biel) (2457) (Protot
ype) (2K).bin      39%  OK
Extracting /content/ROM/Venture (1982) (Coleco, Joseph Biel) (2457) ~.bin
39%  OK
Extracting /content/ROM/Venture (1983) (CBS Electronics, Joseph Biel) (4L18
02, 4L1803, 4L1804, 4L2278) (PAL).bin      39%  OK
Extracting /content/ROM/Venture (1987) (Atari) (CX26145).bin
39%  OK
Extracting /content/ROM/Viagem Espacial (AKA Star Voyager) (Dismac).bin
39%  OK
Extracting /content/ROM/Video Checkers - Atari Video Checkers (1980) (Atar
i, Carol Shaw) (CX2636, CX2636P) (PAL).bin      39%  OK
Extracting /content/ROM/Video Checkers - Checkers - Atari Video Checkers (1
980) (Atari, Carol Shaw - Sears) (CX2636 - 49-75156) ~.bin      39%  OK
Extracting /content/ROM/Video Chess (Computer Chess) (1979) (Atari, Larry W
agner, Bob Whitehead - Sears) (CX2645 - 49-75181) ~.bin      39%  OK
Extracting /content/ROM/Video Chess (Computer Chess) (1979) (Atari, Larry W
agner, Bob Whitehead) (CX2645, CX2645P) (PAL).bin      39%  OK
Extracting /content/ROM/Video Chess (Unknown) (PAL).bin
39%  OK
Extracting /content/ROM/Video Chess (Unknown).bin
39%  OK
Extracting /content/ROM/Video Jogger (Foot Craz) (1983) (Exus Corporation)
~.bin      39%  OK
Extracting /content/ROM/Video Life (1984) (CommaVid, John Bronstein) (CM-00
2) [higher sounds] ~.bin      39%  OK
Extracting /content/ROM/Video Life (1984) (CommaVid, John Bronstein) (CM-00
2) ~.bin      39%  OK
Extracting /content/ROM/Video Olympics (Paddle) (1977) (Atari, Joe Decuir)
(CX2621, CX2621P) (PAL).bin      39%  OK
Extracting /content/ROM/Video Olympics - Pong Sports (Paddle) (1977) (Atar
i, Joe Decuir - Sears) (CX2621 - 99806, 6-99806, 49-75104) ~.bin      3
9%  OK
Extracting /content/ROM/Video Pinball (1981) (Atari, Bob Smith) (CX2648) (P
AL).bin      39%  OK
Extracting /content/ROM/Video Pinball (Hack) (32 in 1) (Bit Corporation) (R
320).bin      39%  OK
Extracting /content/ROM/Video Pinball (Unknown) (PAL).bin

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0000 39%000000 OK
Extracting /content/ROM/Video Pinball (Unknown).bin
0000 39%000000 OK
Extracting /content/ROM/Video Pinball - Arcade Pinball (1981) (Atari, Bob S
mith - Sears) (CX2648 - 49-75161) ~.bin 0000 39%000000 OK
Extracting /content/ROM/Video Reflex (Foot Craz) (1983) (Exus Corporation)
[no roman numbers] ~.bin 0000 39%000000 OK
Extracting /content/ROM/Video Reflex (Foot Craz) (1983) (Exus Corporation)
~.bin 0000 39%000000 OK
Extracting /content/ROM/Vogel Flieh (AKA Dolphin) (1983) (Quelle) (465.302
8) (PAL).bin 0000 39%000000 OK
Extracting /content/ROM/Volleyball (AKA RealSports Volleyball) (1983) (Digi
tel).bin 0000 39%000000 OK
Extracting /content/ROM/Volleyball (AKA RealSports Volleyball) (Dactari - M
ilmar).bin 0000 39%000000 OK
Extracting /content/ROM/Volleyball (AKA RealSports Volleyball) (Double-Game
Package) (1983) (Otto Versand) (781698) (PAL).bin 0000 39%000000 OK
Extracting /content/ROM/Volleyball (AKA RealSports Volleyball) (Fotomania).
bin 0000 39%000000 OK
Extracting /content/ROM/Volleyball (AKA RealSports Volleyball) (Robby).bin
0000 39%000000 OK
Extracting /content/ROM/Vom Himmel durch die Hoelle (AKA Parachute) (1983)
(Quelle) (719.941 7) (PAL).bin 0000 39%000000 OK
Extracting /content/ROM/Vulture Attack (AKA Condor Attack) (1982) (K-Tel Vi
sion) (PAL).bin 0000 39%000000 OK
Extracting /content/ROM/Vulture Attack (AKA Condor Attack) (1982) (K-Tel Vi
sion).bin 0000 39%000000 OK
Extracting /content/ROM/Video Cube (AKA Atari Video Cube) (CCE).bin
0000 39%000000 OK
Extracting /content/ROM/Wabbit (1982) (Apollo, Ban Tran) (AP-2010) ~.bin
0000 39%000000 OK
Extracting /content/ROM/Wachroboter jagt Jupy (AKA Keystone Kapers) (1983)
(Quelle) (715.853 5) (PAL).bin 0000 39%000000 OK
Extracting /content/ROM/Walker (AKA Guignol) (1983) (Suntek) (SS-032) (PA
L).bin 0000 39%000000 OK
Extracting /content/ROM/Wall Ball (1983) (Avalon Hill, Duncan Scott) (50030
02) ~.bin 0000 39%000000 OK
Extracting /content/ROM/Wall Break (1983) (Home Vision - Gem International
Corporation - VDI) (VCS83114) (PAL) ~.bin 0000 39%000000 OK
Extracting /content/ROM/Wall Break (Unknown).bin
0000 39%000000 OK
Extracting /content/ROM/Wall Defender (AKA Wall Break) (HES) (PAL).bin
0000 40%000000 OK
Extracting /content/ROM/Wall-Defender (AKA Wall Break) (1983) (Bomb - Onbas
e) (CA285) (PAL).bin 0000 40%000000 OK
Extracting /content/ROM/Wall-Defender (AKA Wall Break) (1983) (Bomb - Onbas
e) (CA285).bin 0000 40%000000 OK
Extracting /content/ROM/War 2000 (AKA Astrowar) (1983) (Home Vision - Gem I
nternational Corporation - VDI) (VCS83102) (PAL).bin 0000 40%000000 OK
Extracting /content/ROM/Warlords (Kings in the Corner) (Paddle) (1981) (Ata
ri, Carla Meninsky - Sears) (CX2610 - 49-75127) ~.bin 0000 40%000000 OK
Extracting /content/ROM/Warlords (Kings in the Corner) (Paddle) (1981) (Ata
ri, Carla Meninsky) (CX2610) (PAL).bin 0000 40%000000 OK
Extracting /content/ROM/Warplack (Paddle) (1982) (Data Age) (DA1002) ~.bin
0000 40%000000 OK
Extracting /content/ROM/Warplack (Paddle) (1983) (Gameworld) (133-002) (PA

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L).bin      0000 40%000000 OK
Extracting /content/ROM/Weltraumtunnel (AKA Innerspace) (1983) (Quelle) (29
2.651 7) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Westward Ho (AKA Custer's Revenge) (1982) (PlayArou
nd - JHM) (206) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Wilma Wanderer (AKA Lilly Adventure) (1983) (ITT Fa
mily Games) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Wing War (Flap!) (1983) (Imagic, Michael Greene) (E
IZ-002-04I) (PAL) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Wings (06-03-1983) (CBS Electronics, Stuart Ross)
(Prototype) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Wings (10-10-1983) (CBS Electronics, Stuart Ross)
(Prototype) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Winter Games (1987) (Epyx, Steven A. Baker, Tod Fry
e, Peter Engelbrite) (80561-00251) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Winter Games (1987) (Epyx, Steven A. Baker, Tod Fry
e, Peter Engelbrite) (80561-00251) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Winterjagd (AKA Ski Hunt) (1983) (Quelle) (343.073
3) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Wizard (1980) (Atari, Chris Crawford) (Prototype)
[a].bin      0000 40%000000 OK
Extracting /content/ROM/Wizard (1980) (Atari, Chris Crawford) (Prototype)
~.bin      0000 40%000000 OK
Extracting /content/ROM/Wizard of Wor (1982) (CBS Electronics - Roklan, Joe
Hellesen, Joe Wagner) (4L1720, 4L1721, 4L1722, 4L2276) (PAL).bin      0000 4
0%000000 OK
Extracting /content/ROM/Wizard of Wor (1982) (CBS Electronics - Roklan, Joe
Hellesen, Joe Wagner) (M8774, M8794) (Prototype).bin      0000 40%000000 OK
Extracting /content/ROM/Wizard of Wor (1982) (CBS Electronics - Roklan, Joe
Hellesen, Joe Wagner) (M8774, M8794) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Word Zapper (Unknown) (PAL) [a].bin
0000 40%000000 OK
Extracting /content/ROM/Word Zapper (Unknown) (PAL).bin
0000 40%000000 OK
Extracting /content/ROM/Word Zapper (Unknown).bin
0000 40%000000 OK
Extracting /content/ROM/Word Zapper (Word Grabber) (1982) (U.S. Games Corpo
ration - Vidtec - JWDA, Todd Marshall, Henry Will IV) (VC1003) ~.bin
0000 40%000000 OK
Extracting /content/ROM/Words-Attack (1983) (Sancho - Tang's Electronic C
o.) (Prototype) (PAL) ~.bin      0000 40%000000 OK
Extracting /content/ROM/World End (AKA The End of the World) (1983) (Home V
ision - Gem International Corporation - VDI) (VCS83109) (PAL).bin      0000 4
0%000000 OK
Extracting /content/ROM/Worm War I (1982) (20th Century Fox Video Games - S
irius Software, David Lubar) (11001) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Worm War I (1983) (CCE) (C-843).bin
0000 40%000000 OK
Extracting /content/ROM/Worm War I (Unknown) (PAL) [a].bin
0000 40%000000 OK
Extracting /content/ROM/Worm War I (Unknown) (PAL).bin
0000 40%000000 OK
Extracting /content/ROM/Wuestenschlacht (AKA Chopper Command) (1983) (Quell
e) (262.794 1) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/X'Mission (Unknown) (PAL).bin
0000 40%000000 OK

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Extracting /content/ROM/X-Man (1983) (Universal Gamex Corporation, Miguel C
astillo, H.K. Poon) (GX-001) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/X-Man (1983) (Universal Gamex Corporation, Miguel C
astillo, H.K. Poon) (GX-001) ~.bin        0000 40%000000 OK
Extracting /content/ROM/Xenophobe (1991) (Atari) (CX26172) (PAL).bin
0000 40%000000 OK
Extracting /content/ROM/Xenophobe (1991) (Atari) (CX26172) ~.bin
0000 40%000000 OK
Extracting /content/ROM/Xevious (01-18-1984) (Atari, Tod Frye) (CX2695) (Pr
ototype) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Xevious (05-25-1983) (Atari, Tod Frye) (CX2695) (Pr
ototype).bin        0000 40%000000 OK
Extracting /content/ROM/Xevious (08-02-1983) (Atari, Tod Frye) (CX2695) (Pr
ototype).bin        0000 40%000000 OK
Extracting /content/ROM/Xevious (CCE).bin
0000 40%000000 OK
Extracting /content/ROM/Yars' Revenge (Canal 3 - Intellivision).bin
0000 40%000000 OK
Extracting /content/ROM/Yars' Revenge (Time Freeze) (09-01-81) (Atari, Howa
rd Scott Warshaw - Sears) (CX2655 - 49-75167) (Prototype).bin      0000 4
0%000000 OK
Extracting /content/ROM/Yars' Revenge (Time Freeze) (1982) (Atari, Howard S
cott Warshaw - Sears) (CX2655 - 49-75167) ~.bin      0000 40%000000 OK
Extracting /content/ROM/Yars' Revenge (Time Freeze) (1982) (Atari, Howard S
cott Warshaw) (CX2655, CX2655P) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Yars' Revenge (Unknown) (PAL).bin
0000 40%000000 OK
Extracting /content/ROM/Year 1999, The (AKA Condor Attack) (1983) (Rainbow
Vision - Suntek) (SS-008) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Z-Tack (AKA Base Attack) (1983) (Bomb - Onbase) (CA
283) (PAL).bin      0000 40%000000 OK
Extracting /content/ROM/Z-Tack (AKA Base Attack) (1983) (Bomb - Onbase) (CA
283).bin      0000 41%000000 OK
Extracting /content/ROM/Zaxxon (1983) (CBS Electronics) (4L1784, 4L1786, 4L
1787, 4L2277) (PAL).bin      0000 41%000000 OK
Extracting /content/ROM/Zaxxon (1983) (Coleco) (2454) ~.bin
0000 41%000000 OK
Extracting /content/ROM/Zaxxon (Unknown) (PAL).bin
0000 41%000000 OK
Extracting /content/ROM/Zoo Fun (AKA Pumuckl at the Zoo) (1983) (Suntek) (S
S-027) (PAL).bin      0000 41%000000 OK
Extracting /content/ROM/Zoo Keeper Sounds (1984) (Atari, Christopher H. Oma
rzu, Robert Vieira) (CX26121) (Prototype) ~.bin      0000 41%000000 OK
Extracting /content/ROM/===== ROM HUNTER'S HARMONY CART ORIGINAL 1977-19
92 VCS ROMS COLLECTION V12 =====.txt      0000 41%000000 OK
Extracting /content/ROM/128 in 1 Game Select ROM.bin
0000 41%000000 OK
Extracting /content/ROM/208 in 1 Game Select ROM (PAL).bin
0000 41%000000 OK
Extracting /content/ROM/3-D Genesis (Prototype).bin
0000 41%000000 OK
Extracting /content/ROM/3-D Ghost Attack (Prototype).bin
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Extracting /content/ROM/3-D Havoc (Prototype).bin
0000 41%000000 OK
Extracting /content/ROM/3-D Tic-Tac-Toe.bin

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0000 41%000000 OK
Extracting /content/ROM/3-D Zapper (Prototype).bin
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Extracting /content/ROM/Acid Drop (PAL).bin
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Extracting /content/ROM/Actionauts.bin
0000 41%000000 OK
Extracting /content/ROM/Activision Decathlon, The [fixed].bin
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Extracting /content/ROM/Activision Decathlon, The.bin
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Extracting /content/ROM/Adventure.bin
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Extracting /content/ROM/Adventures of TRON.bin
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Extracting /content/ROM/Air Raid (PAL).bin
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Extracting /content/ROM/Air Raiders.bin
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Extracting /content/ROM/Air-Sea Battle - Target Fun.bin
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Extracting /content/ROM/Airlock.bin
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Extracting /content/ROM/Alien.bin
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Extracting /content/ROM/Alligator People (Prototype).bin
0000 41%000000 OK
Extracting /content/ROM/Alpha Beam with Ernie.bin
0000 41%000000 OK
Extracting /content/ROM/Amidar.bin
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Extracting /content/ROM/AndroMan on the Moon (Prototype).bin
0000 41%000000 OK
Extracting /content/ROM/Aquaventure (Prototype).bin
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Extracting /content/ROM/Arkyology (Prototype).bin
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Extracting /content/ROM/Armor Ambush.bin
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Extracting /content/ROM/Artillery Duel.bin
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Extracting /content/ROM/Asteroid Fire (PAL).bin
0000 41%000000 OK
Extracting /content/ROM/Asteroids [no copyright].bin
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Extracting /content/ROM/Asteroids.bin
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Extracting /content/ROM/Astro Chase (Prototype).bin
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Extracting /content/ROM/Astroblast [fixed].bin
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Extracting /content/ROM/Astroblast.bin
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Extracting /content/ROM/Astrowar (PAL).bin
0000 41%000000 OK
Extracting /content/ROM/Atari Video Cube.bin
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0000 41%000000 OK
Extracting /content/ROM/Atlantis.bin
0000 41%000000 OK
Extracting /content/ROM/Atom Smasher (Prototype).bin
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Extracting /content/ROM/Bachelor Party.bin
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Extracting /content/ROM/Backgammon.bin
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Extracting /content/ROM/Bank Heist.bin
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Extracting /content/ROM/Barnstorming.bin
0000 41%000000 OK
Extracting /content/ROM/Base Attack (PAL).bin
0000 41%000000 OK
Extracting /content/ROM/Basic Math - Math.bin
0000 41%000000 OK
Extracting /content/ROM/BASIC Programming.bin
0000 41%000000 OK
Extracting /content/ROM/Basketball.bin
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Extracting /content/ROM/Battlezone.bin
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Extracting /content/ROM/Beamrider.bin
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Extracting /content/ROM/Beany Bopper.bin
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Extracting /content/ROM/Bear Game Demo.bin
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Extracting /content/ROM/Beat 'Em & Eat 'Em.bin
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Extracting /content/ROM/Berenstain Bears.bin
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Extracting /content/ROM/Bermuda Triangle.bin
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Extracting /content/ROM/Berzerk.bin
0000 42%000000 OK
Extracting /content/ROM/Big Bird's Egg Catch.bin
0000 42%000000 OK
Extracting /content/ROM/Bionic Breakthrough (Prototype).bin
0000 42%000000 OK
Extracting /content/ROM/Birthday Mania.bin
0000 42%000000 OK
Extracting /content/ROM/Blackjack - Black Jack.bin
0000 42%000000 OK
Extracting /content/ROM/Blueprint.bin
0000 42%000000 OK
Extracting /content/ROM/BMX Air Master.bin
0000 42%000000 OK
Extracting /content/ROM/Bobby Is Going Home (PAL) [demonstration cartridge].bin 0000 42%000000 OK
Extracting /content/ROM/Bobby Is Going Home (PAL).bin
0000 42%000000 OK
Extracting /content/ROM/Boggle (Prototype).bin
0000 42%000000 OK
Extracting /content/ROM/Boing!.bin
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0000 42%000000 OK
Extracting /content/ROM/Bouncin' Baby Bunnies (Prototype).bin
0000 42%000000 OK
Extracting /content/ROM/Bowling.bin
0000 42%000000 OK
Extracting /content/ROM/Boxing.bin
0000 42%000000 OK
Extracting /content/ROM/Brain Games.bin
0000 42%000000 OK
Extracting /content/ROM/Breakout - Breakaway IV.bin
0000 42%000000 OK
Extracting /content/ROM/Bridge [fixed].bin
0000 42%000000 OK
Extracting /content/ROM/Bridge.bin
0000 42%000000 OK
Extracting /content/ROM/Buck Rogers - Planet of Zoom.bin
0000 42%000000 OK
Extracting /content/ROM/Bugs Bunny (Prototype).bin
0000 42%000000 OK
Extracting /content/ROM/Bugs.bin
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Extracting /content/ROM/Bump 'n' Jump.bin
0000 42%000000 OK
Extracting /content/ROM/Bumper Bash.bin
0000 42%000000 OK
Extracting /content/ROM/BurgerTime.bin
0000 42%000000 OK
Extracting /content/ROM/Burning Desire (PAL).bin
0000 42%000000 OK
Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (Prototype).bin
0000 42%000000 OK
Extracting /content/ROM/Cakewalk.bin
0000 42%000000 OK
Extracting /content/ROM/California Games.bin
0000 42%000000 OK
Extracting /content/ROM/Canyon Bomber.bin
0000 42%000000 OK
Extracting /content/ROM/Care Bears (Prototype).bin
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Extracting /content/ROM/Carnival.bin
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Extracting /content/ROM/Casino - Poker Plus.bin
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Extracting /content/ROM/Cat Trax.bin
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Extracting /content/ROM/Chopper Command.bin
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Extracting /content/ROM/Chuck Norris Superkicks.bin
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Extracting /content/ROM/Color Bar Generator.bin
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Extracting /content/ROM/Depth Charge (Prototype).bin
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Extracting /content/ROM/Donald Duck's Speedboat (Prototype).bin
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Extracting /content/ROM/G.I. Joe - Cobra Strike.bin
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Extracting /content/ROM/Hard-Head (Prototype).bin
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Extracting /content/ROM/Human Cannonball - Cannon Man.bin
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Extracting /content/ROM/Laser Blast.bin
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Extracting /content/ROM/Looping (Prototype).bin
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Extracting /content/ROM/Lord of the Rings, The - Journey to Rivendell (Prototype).bin █████ 46%████ OK
Extracting /content/ROM/Lost Luggage [no opening scene].bin
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Extracting /content/ROM/Mario Bros..bin
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Extracting /content/ROM/Master Builder.bin
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Extracting /content/ROM/Masters of the Universe - The Power of He-Man.bin
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Extracting /content/ROM/Math Gran Prix.bin
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Extracting /content/ROM/Maze Craze - A Game of Cops 'n Robbers - Maze Mania
- A Game of Cops 'n Robbers.bin █████ 46%████ OK
Extracting /content/ROM/McDonald's - Golden Arches Adventure (Prototype).bi
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Extracting /content/ROM/Mega Force.bin
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Extracting /content/ROM/MegaMania - A Space Nightmare.bin
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Extracting /content/ROM/Meltdown (Prototype).bin
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Extracting /content/ROM/Midnight Magic.bin
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Extracting /content/ROM/Mind Maze (Prototype).bin
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Extracting /content/ROM/Miner 2049er - Starring Bounty Bob [fixed].bin
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Extracting /content/ROM/Miner 2049er - Starring Bounty Bob.bin
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Extracting /content/ROM/Miner 2049er Volume II.bin
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Extracting /content/ROM/Miniature Golf - Arcade Golf.bin
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Extracting /content/ROM/Miss Piggy's Wedding (Prototype).bin
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Extracting /content/ROM/Missile Command [no initials].bin
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Extracting /content/ROM/Mission 3,000 A.D. (PAL) [demonstration cartridge].
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Extracting /content/ROM/Mission 3,000 A.D. (PAL).bin
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Extracting /content/ROM/Mission Survive (PAL) [louder sounds].bin
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Extracting /content/ROM/Mogul Maniac.bin
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Extracting /content/ROM/Monster Cise (Prototype).bin
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Extracting /content/ROM/Montezuma's Revenge - Featuring Panama Joe.bin
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Extracting /content/ROM/Ms. Pac-Man.bin
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Extracting /content/ROM/Music Demo.bin
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Extracting /content/ROM/My Golf (PAL) [fixed].bin
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Extracting /content/ROM/Mysterious Thief, A (Prototype).bin
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Extracting /content/ROM/Nuts (PAL).bin
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Extracting /content/ROM/Omega Race.bin
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Extracting /content/ROM/Open, Sesame! (PAL).bin
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Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep,
Down on the Line, Handcar.bin 0000 48%000000 OK
Extracting /content/ROM/Peek-A-Boo (Prototype).bin
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Extracting /content/ROM/Pete Rose Baseball.bin
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Extracting /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure.bin
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Extracting /content/ROM/Reactor.bin
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Extracting /content/ROM/RealSports Baseball.bin
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Extracting /content/ROM/RealSports Basketball (Prototype) (PAL).bin
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Extracting /content/ROM/RealSports Boxing.bin
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Extracting /content/ROM/RealSports Soccer [no opening tune].bin
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Extracting /content/ROM/RealSports Soccer.bin
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Extracting /content/ROM/RealSports Tennis.bin
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Extracting /content/ROM/Rescue Terra I.bin
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Extracting /content/ROM/Revenge of the Beefsteak Tomatoes.bin
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Extracting /content/ROM/Go Go Home Monster (PAL).bin
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Extracting /content/ROM/Golf (PAL).bin
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Extracting /content/ROM/Gorf (PAL).bin
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Extracting /content/ROM/3-D Genesis (Prototype).bin
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Extracting /content/ROM/3-D Ghost Attack (Prototype).bin
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Extracting /content/ROM/3-D Havoc (Prototype).bin
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Extracting /content/ROM/3-D Zapper (Prototype).bin
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Extracting /content/ROM/Alligator People (Prototype).bin
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Extracting /content/ROM/AndroMan on the Moon (Prototype).bin
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Extracting /content/ROM/Atari Video Cube.bin
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Extracting /content/ROM/Atlantis II.bin
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Extracting /content/ROM/Atom Smasher (Prototype).bin
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Extracting /content/ROM/Bachelor Party.bin
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Extracting /content/ROM/Beany Bopper.bin
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Extracting /content/ROM/Bear Game Demo.bin
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Extracting /content/ROM/Berenstain Bears.bin
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Extracting /content/ROM/Bionic Breakthrough.bin
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Extracting /content/ROM/Birthday Mania.bin
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Extracting /content/ROM/Boggle (Prototype).bin
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Extracting /content/ROM/Bouncin' Baby Bunnies (Prototype).bin
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Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (Protot
ype).bin █████ 57%████ OK
Extracting /content/ROM/Care Bears (Prototype).bin
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Extracting /content/ROM/Cat Trax.bin
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Extracting /content/ROM/Cathouse Blues.bin
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Extracting /content/ROM/Chase the Chuck Wagon.bin
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Extracting /content/ROM/Coco Nuts.bin
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Extracting /content/ROM/Mission 3,000 A.D. (PAL).bin
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Extracting /content/ROM/Mr. Postman (PAL).bin
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Extracting /content/ROM/My Golf (PAL) [fixed].bin
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Extracting /content/ROM/My Golf (PAL).bin
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Extracting /content/ROM/No Escape! (PAL).bin
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Extracting /content/ROM/Nuts (PAL).bin
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Extracting /content/ROM/Official Frogger, The (PAL).bin
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Extracting /content/ROM/0pen, Sesame! (PAL).bin
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Extracting /content/ROM/Panda Chase (PAL).bin
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Extracting /content/ROM/Parachute (PAL).bin
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Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep,
Down on the Line, Handcar (PAL).bin █████ 59%████ OK
Extracting /content/ROM/Pengo (PAL).bin
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Extracting /content/ROM/Pete Rose Baseball (PAL).bin
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Extracting /content/ROM/Phantom Tank (PAL).bin
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Extracting /content/ROM/Phaser Patrol (PAL).bin
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Extracting /content/ROM/Pick 'n' Pile (PAL).bin
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Extracting /content/ROM/Picnic (PAL).bin
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Extracting /content/ROM/RealSports Boxing (PAL).bin
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Extracting /content/ROM/RealSports Soccer (PAL).bin
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Extracting /content/ROM/Hard-Head (Prototype).bin
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Extracting /content/ROM/Holey Moley.bin
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Extracting /content/ROM/Ixion (Prototype).bin
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Extracting /content/ROM/James Bond 007.bin
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Extracting /content/ROM/Kyphus (Prototype).bin
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Extracting /content/ROM/Lord of the Rings, The - Journey to Rivendell (Prot
otype).bin █████ 60%████ OK
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Extracting /content/ROM/Meltdown (Prototype).bin
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Extracting /content/ROM/Mind Maze (Prototype).bin
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Extracting /content/ROM/Morse Code Tutor.bin
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Extracting /content/ROM/Music Machine, The.bin
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Extracting /content/ROM/Off Your Rocker (Prototype).bin
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Extracting /content/ROM/Piece o' Cake.bin
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Extracting /content/ROM/Pizza Chef (Prototype).bin
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Extracting /content/ROM/PlayAround Demo.bin
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Extracting /content/ROM/Pleiades (Prototype).bin
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Extracting /content/ROM/Power Lords (Prototype).bin
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Extracting /content/ROM/Q-bert's Qubes.bin
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Extracting /content/ROM/Racer (Prototype).bin
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Extracting /content/ROM/RealSports Baseball.bin
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Extracting /content/ROM/Rubik's Cube 3-D (Prototype).bin
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Extracting /content/ROM/River Raid II (PAL).bin
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Extracting /content/ROM/Save the Whales (Prototype).bin
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Extracting /content/ROM/Sinistar (Prototype).bin
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Extracting /content/ROM/Star Ship - Outer Space.bin
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Extracting /content/ROM/Steepchase.bin
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Extracting /content/ROM/Stunt Cycle (Prototype).bin
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Extracting /content/ROM/Submarine Commander.bin
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Extracting /content/ROM/Supercharger BIOS.bin
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Extracting /content/ROM/Good Luck, Charlie Brown (Prototype).bin
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Extracting /content/ROM/Gravitar.bin
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Extracting /content/ROM/Gremlins.bin
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Extracting /content/ROM/Grover's Music Maker (Prototype).bin
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Extracting /content/ROM/Hangman - Spelling.bin
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Extracting /content/ROM/Haunted House.bin
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Extracting /content/ROM/Holey Moley (Prototype).bin
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Extracting /content/ROM/Home Run - Baseball.bin
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Extracting /content/ROM/Human Cannonball - Cannon Man.bin
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Extracting /content/ROM/Hunt & Score - Memory Match.bin
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Extracting /content/ROM/Ikari Warriors.bin
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Extracting /content/ROM/Indy 500 - Race.bin
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Extracting /content/ROM/Joust.bin
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Extracting /content/ROM/Jr. Pac-Man.bin
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Extracting /content/ROM/Jungle Hunt.bin
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Extracting /content/ROM/Kangaroo.bin
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Extracting /content/ROM/Klax (PAL).bin
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Extracting /content/ROM/Krull.bin
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Extracting /content/ROM/Mario Bros..bin
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Extracting /content/ROM/Math Gran Prix.bin
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Extracting /content/ROM/Maze Craze - A Game of Cops 'n Robbers - Maze Mania
- A Game of Cops 'n Robbers.bin █████ 69%████ OK
Extracting /content/ROM/Midnight Magic.bin
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Extracting /content/ROM/Millipede.bin
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Extracting /content/ROM/Mind Maze (Prototype).bin
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Extracting /content/ROM/Miniature Golf - Arcade Golf.bin
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Extracting /content/ROM/Miss Piggy's Wedding (Prototype).bin
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Extracting /content/ROM/Missile Command [no initials].bin
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Extracting /content/ROM/Missile Command.bin
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Extracting /content/ROM/Monster Cise (Prototype).bin
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Extracting /content/ROM/Ms. Pac-Man.bin
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Extracting /content/ROM/Night Driver.bin
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Extracting /content/ROM/Obelix.bin
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Extracting /content/ROM/Off the Wall.bin
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Extracting /content/ROM/Oscar's Trash Race.bin
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Extracting /content/ROM/Othello [no grid markers].bin
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Extracting /content/ROM/Othello.bin
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Extracting /content/ROM/Outlaw - Gunslinger.bin
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Extracting /content/ROM/Pac-Man.bin
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Extracting /content/ROM/Peek-A-Boo (Prototype).bin
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Extracting /content/ROM/Pengo.bin
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Extracting /content/ROM/Pigs in Space - Starring Miss Piggy.bin
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Extracting /content/ROM/Polo (Prototype).bin
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Extracting /content/ROM/Quadrun.bin
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Extracting /content/ROM/Racer (Prototype).bin
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Extracting /content/ROM/Radar Lock.bin
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Extracting /content/ROM/Raiders of the Lost Ark.bin
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Extracting /content/ROM/RealSports Baseball.bin
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Extracting /content/ROM/RealSports Basketball (Prototype) (PAL).bin
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Extracting /content/ROM/RealSports Boxing.bin
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Extracting /content/ROM/RealSports Football.bin
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Extracting /content/ROM/RealSports Soccer [no opening tune].bin
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Extracting /content/ROM/RealSports Tennis.bin
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Extracting /content/ROM/RealSports Volleyball.bin
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Extracting /content/ROM/Road Runner.bin
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Extracting /content/ROM/Rubik's Cube 3-D (Prototype).bin
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Extracting /content/ROM/Saboteur (Prototype).bin
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Extracting /content/ROM/Save Mary! (Prototype).bin
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Extracting /content/ROM/Secret Quest.bin
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Extracting /content/ROM/Sentinel.bin
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Extracting /content/ROM/Shooting Arcade (Prototype).bin
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Extracting /content/ROM/Sky Diver - Dare Diver.bin
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Extracting /content/ROM/Slot Machine - Slots.bin
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Extracting /content/ROM/Slot Racers - Maze.bin
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Extracting /content/ROM/Snoopy and the Red Baron.bin
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Extracting /content/ROM/Snow White (Prototype).bin
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Extracting /content/ROM/Sorcerer's Apprentice.bin
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Extracting /content/ROM/Space Invaders.bin
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Extracting /content/ROM/Space War - Space Combat.bin
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Extracting /content/ROM/Star Ship - Outer Space.bin
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Extracting /content/ROM/Stargate.bin
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Extracting /content/ROM/Steeplechase.bin
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Extracting /content/ROM/Stellar Track.bin
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Extracting /content/ROM/Street Racer - Speedway II.bin
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Extracting /content/ROM/Stunt Cycle (Prototype).bin
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Extracting /content/ROM/Submarine Commander.bin
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Extracting /content/ROM/Super Breakout.bin
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Extracting /content/ROM/Super Football.bin
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Extracting /content/ROM/Superman [fixed].bin
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Extracting /content/ROM/Surround - Chase.bin
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Extracting /content/ROM/SwordQuest - FireWorld.bin
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Extracting /content/ROM/SwordQuest - WaterWorld.bin
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Extracting /content/ROM/Taz.bin
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Extracting /content/ROM/Telepathy (Prototype).bin
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Extracting /content/ROM/Tempest (Prototype).bin
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Extracting /content/ROM/Video Chess.bin
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Extracting /content/ROM/Video Olympics - Pong Sports.bin
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Extracting /content/ROM/Video Pinball - Arcade Pinball.bin
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Extracting /content/ROM/Xevious (Prototype).bin
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Extracting /content/ROM/Yars' Revenge.bin
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Extracting /content/ROM/Zoo Keeper Sounds (Prototype).bin
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Extracting /content/ROM/Death Trap.bin
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Extracting /content/ROM/London Blitz.bin
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Extracting /content/ROM/Out of Control.bin
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Extracting /content/ROM/Shuttle Orbiter.bin
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Extracting /content/ROM/Wall Ball.bin
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Extracting /content/ROM/Blueprint.bin
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Extracting /content/ROM/Gorf.bin
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Extracting /content/ROM/Kick-Man (Prototype).bin
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Extracting /content/ROM/Mountain King.bin
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Extracting /content/ROM/Omega Race.bin
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Extracting /content/ROM/Tunnel Runner.bin
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Extracting /content/ROM/Wizard of Wor.bin
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Extracting /content/ROM/Stone Age.bin
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Extracting /content/ROM/Berenstain Bears.bin
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Extracting /content/ROM/Cabbage Patch Kids - Adventures in the Park (Protot
ype).bin █████ 72%████ OK
Extracting /content/ROM/Carnival.bin
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Extracting /content/ROM/Donkey Kong Junior.bin
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Extracting /content/ROM/Front Line.bin
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Extracting /content/ROM/Looping (Prototype).bin
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Extracting /content/ROM/Mouse Trap.bin
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Extracting /content/ROM/Mr. Do!.bin
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Extracting /content/ROM/Roc 'n Rope.bin
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Extracting /content/ROM/Smurf - Rescue in Gargamel's Castle.bin
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Extracting /content/ROM/Smurfs Save the Day.bin
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Extracting /content/ROM/Time Pilot.bin
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Extracting /content/ROM/Turbo (Prototype).bin
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Extracting /content/ROM/Venture.bin
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Extracting /content/ROM/Zaxxon.bin
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Extracting /content/ROM/Cosmic Swarm.bin
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Extracting /content/ROM/Frog Demo (PAL).bin
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Extracting /content/ROM/MagiCard.bin
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Extracting /content/ROM/Mines of Minos.bin
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Extracting /content/ROM/Room of Doom.bin
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Extracting /content/ROM/Rush Hour (Prototype).bin
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Extracting /content/ROM/Stronghold.bin
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Extracting /content/ROM/Video Life [higher sounds].bin
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Extracting /content/ROM/GameLine Master Module ROM.bin
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Extracting /content/ROM/Bermuda Triangle.bin
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Extracting /content/ROM/Bugs.bin
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Extracting /content/ROM/Encounter at L-5.bin
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Extracting /content/ROM/Frankenstein's Monster.bin
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Extracting /content/ROM/Journey Escape.bin
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Extracting /content/ROM/Secret Agent (Prototype).bin
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Extracting /content/ROM/Survival Run (Prototype).bin
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Extracting /content/ROM/Warplock.bin
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Extracting /content/ROM/Unknown Datatech Game.bin
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Extracting /content/ROM/Astrowar (PAL).bin
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Extracting /content/ROM/MegaBoy.bin
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Extracting /content/ROM/California Games.bin
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Extracting /content/ROM/Summer Games.bin
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Extracting /content/ROM/Winter Games.bin
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Extracting /content/ROM/Video Jogger.bin
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Extracting /content/ROM/Boing!.bin
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Extracting /content/ROM/Inca Gold (PAL).bin
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Extracting /content/ROM/Time Warp (PAL).bin
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Extracting /content/ROM/Gamma-Attack.bin
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Extracting /content/ROM/My Golf (PAL) [fixed].bin
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Extracting /content/ROM/My Golf (PAL).bin
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Extracting /content/ROM/Asteroid Fire (PAL).bin
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Extracting /content/ROM/Base Attack (PAL).bin
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Extracting /content/ROM/Frisco (PAL).bin
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Extracting /content/ROM/Lilly Adventure (PAL).bin
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Extracting /content/ROM/Panda Chase (PAL).bin
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Extracting /content/ROM/Parachute (PAL).bin
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Extracting /content/ROM/Racing Car (PAL).bin
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Extracting /content/ROM/Wall Break (PAL).bin
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Extracting /content/ROM/Arkyology (Prototype).bin
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Extracting /content/ROM/Cosmic Ark.bin
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Extracting /content/ROM/Cubicolor (Prototype).bin
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Extracting /content/ROM/Demon Attack [fixed].bin
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Extracting /content/ROM/Demon Attack.bin
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Extracting /content/ROM/Dragonfire.bin
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Extracting /content/ROM/Laser Gates.bin
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Extracting /content/ROM/Moonsweeper.bin
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Extracting /content/ROM/No Escape!.bin
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Extracting /content/ROM/Quick Step!.bin
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Extracting /content/ROM/Riddle of the Sphinx.bin
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Extracting /content/ROM/Shootin' Gallery.bin
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Extracting /content/ROM/Sky Patrol (Prototype).bin
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Extracting /content/ROM/Solar Storm.bin
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Extracting /content/ROM/Star Voyager.bin
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Extracting /content/ROM/Subterranea.bin
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Extracting /content/ROM/Wing War (PAL).bin
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Extracting /content/ROM/Euro Gen (PAL).bin
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Extracting /content/ROM/Music Demo.bin
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Extracting /content/ROM/Armor Ambush.bin
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Extracting /content/ROM/Bump 'n' Jump.bin
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Extracting /content/ROM/BurgerTime.bin
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Extracting /content/ROM/Dark Cavern.bin
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Extracting /content/ROM/Frogs and Flies.bin
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Extracting /content/ROM/International Soccer.bin
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Extracting /content/ROM/Lock 'n' Chase.bin
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Extracting /content/ROM/Masters of the Universe - The Power of He-Man.bin
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Extracting /content/ROM/Rocky & Bullwinkle (Prototype).bin
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Extracting /content/ROM/Star Strike.bin
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Extracting /content/ROM/Super Challenge Baseball.bin
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Extracting /content/ROM/Swordfight.bin
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Extracting /content/ROM/TRON - Deadly Discs.bin
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Extracting /content/ROM/Air Raid (PAL).bin
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Extracting /content/ROM/Spitfire Attack.bin
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Extracting /content/ROM/128 in 1 Game Select ROM.bin
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Extracting /content/ROM/208 in 1 Game Select ROM (PAL).bin
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Extracting /content/ROM/Morse Code Tutor.bin
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Extracting /content/ROM/VCS Draw Demo.bin
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Extracting /content/ROM/Astro Chase (Prototype).bin
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Extracting /content/ROM/Care Bears (Prototype).bin
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Extracting /content/ROM/Frogger II - Threedeeep!.bin
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Extracting /content/ROM/G.I. Joe - Cobra Strike.bin
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Extracting /content/ROM/Gyruss.bin
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Extracting /content/ROM/James Bond 007.bin
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Extracting /content/ROM/Lord of the Rings, The - Journey to Rivendell (Prototype).bin █████ 74%████ OK
Extracting /content/ROM/McDonald's - Golden Arches Adventure (Prototype).bin █████ 74%████ OK
Extracting /content/ROM/Montezuma's Revenge - Featuring Panama Joe.bin
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Extracting /content/ROM/Mr. Do!'s Castle.bin
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Extracting /content/ROM/Popeye.bin
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Extracting /content/ROM/Q-bert's Qubes.bin
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Extracting /content/ROM/Sky Skipper.bin
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Extracting /content/ROM/Spider-Man.bin
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Extracting /content/ROM/Star Wars - Jedi Arena.bin
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Extracting /content/ROM/Star Wars - Return of the Jedi - Death Star Battle.bin █████ 75%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Ewok Adventure (Prototype).bin █████ 75%████ OK
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Extracting /content/ROM/Birthday Mania.bin
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Extracting /content/ROM/Power Lords (Prototype).bin
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Extracting /content/ROM/Pursuit of the Pink Panther (Prototype).bin
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Extracting /content/ROM/Bobby Is Going Home (PAL) [demonstration cartridge].bin
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Extracting /content/ROM/Bobby Is Going Home (PAL).bin
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Extracting /content/ROM/Dancing Plate (PAL).bin
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Extracting /content/ROM/Mission 3,000 A.D. (PAL) [demonstration cartridge].bin
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Extracting /content/ROM/Snail Against Squirrel (PAL).bin
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Extracting /content/ROM/Space Tunnel (PAL).bin
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Extracting /content/ROM/Glib - Video Word Game.bin
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Extracting /content/ROM/Acid Drop (PAL).bin
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Extracting /content/ROM/Ghostbusters II (PAL) [different tune].bin
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Extracting /content/ROM/Ghostbusters II (PAL).bin
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Extracting /content/ROM/Pick 'n' Pile (PAL).bin
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Extracting /content/ROM/Dice Puzzle (PAL).bin
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Extracting /content/ROM/Forest (PAL).bin
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Extracting /content/ROM/Congo Bongo.bin
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Extracting /content/ROM/Extra Terrestrials.bin
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Extracting /content/ROM/Chase the Chuck Wagon.bin
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Extracting /content/ROM/CompuMate.bin
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Extracting /content/ROM/Gangster Alley.bin
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Extracting /content/ROM/Gas Hog [fixed].bin
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Extracting /content/ROM/Mangia'.bin
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Extracting /content/ROM/Master Builder.bin
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Extracting /content/ROM/Planet Patrol.bin
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Extracting /content/ROM/Communist Mutants from Space.bin
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Extracting /content/ROM/Killer Satellites.bin
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Down on the Line, Handcar.bin █████ 76%████ OK
Extracting /content/ROM/Phaser Patrol.bin
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Extracting /content/ROM/Miner 2049er - Starring Bounty Bob [fixed].bin
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Extracting /content/ROM/Holey Moley.bin
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Extracting /content/ROM/Miss Piggy's Wedding (Prototype).bin
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Extracting /content/ROM/Racer (Prototype).bin
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Extracting /content/ROM/Road Runner (PAL).bin
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Extracting /content/ROM/Space Invaders (PAL) [different speed and colors].b
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Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep,
Down on the Line, Handcar (PAL).bin █████ 88%████ OK
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Extracting /content/ROM/I.Q. Memory Teaser (PAL).bin
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Extracting /content/ROM/Mole Hunter (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Motocross (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Ski Run (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Spectracube Invasion (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Treasure Island (PAL).bin
████ 89%████ OK
Extracting /content/ROM/UFO Patrol (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Walker (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Kamikaze Saucers (Prototype).bin
████ 89%████ OK
Extracting /content/ROM/Nuts (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Pharaoh's Curse (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Save Our Ship (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Adventures on GX-12 (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Armor Ambush (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Astroblast (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Baseball (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Bogey Blaster (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Bump 'n' Jump (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Deadly Discs (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Football (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Frogs and Flies (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Glacier Patrol (PAL).bin
████ 89%████ OK
Extracting /content/ROM/International Soccer (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Lock 'n' Chase (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Night Stalker (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Quest for Quintana Roo (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Space Attack (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Star Strike (PAL).bin
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████ 89%████ OK
Extracting /content/ROM/Universal Chaos (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Cosmic Creeps (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Demolition Herby (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Fast Food (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Ram It (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Bouncin' Baby Bunnies (Prototype).bin
████ 89%████ OK
Extracting /content/ROM/Coco Nuts.bin
████ 89%████ OK
Extracting /content/ROM/Stargunner (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Espial (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Jawbreaker (PAL).bin
████ 89%████ OK
Extracting /content/ROM/King Kong (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Marauder (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Miner 2049er Volume II (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Polaris (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Raft Rider (PAL).bin
████ 89%████ OK
Extracting /content/ROM/River Patrol.bin
████ 89%████ OK
Extracting /content/ROM/Springer (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Threshold (PAL).bin
████ 89%████ OK
Extracting /content/ROM/3-D Zapper (Prototype).bin
████ 89%████ OK
Extracting /content/ROM/Entombed.bin
████ 89%████ OK
Extracting /content/ROM/Piece o' Cake.bin
████ 89%████ OK
Extracting /content/ROM/Squeeze Box.bin
████ 89%████ OK
Extracting /content/ROM/Word Zapper (PAL).bin
████ 89%████ OK
Extracting /content/ROM/Cat Trax.bin
████ 89%████ OK
Extracting /content/ROM/Funky Fish (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Pleiades (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Condor Attack (PAL).bin
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████ 90%████ OK
Extracting /content/ROM/Karate (PAL).bin
████ 90%████ OK
Extracting /content/ROM/X-Man (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Rescue Terra I.bin
████ 90%████ OK
Extracting /content/ROM/Missile Control (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Mission Survive (PAL) [louder sounds].bin
████ 90%████ OK
Extracting /content/ROM/Mission Survive (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Steepchase (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Surfer's Paradise - But Danger Below! (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Treasure Below (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Atom Smasher (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Color Bar Generator.bin
████ 90%████ OK
Extracting /content/ROM/Golf Diagnostic (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/AndroMan on the Moon (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Halloween.bin
████ 90%████ OK
Extracting /content/ROM/Texas Chainsaw Massacre, The (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Texas Chainsaw Massacre, The.bin
████ 90%████ OK
Extracting /content/ROM/Artillery Duel (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Ghost Manor (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Motocross Racer.bin
████ 90%████ OK
Extracting /content/ROM/Tomarc the Barbarian.bin
████ 90%████ OK
Extracting /content/ROM/Robin Hood (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Sir Lancelot (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Spike's Peak (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Super Kung-Fu (PAL).bin
████ 90%████ OK
Extracting /content/ROM/Pizza Chef (Prototype).bin
████ 90%████ OK
Extracting /content/ROM/Garfield.txt
████ 90%████ OK
Extracting /content/ROM/Assault (AKA Sky Alien) (1983) (Bomb - Onbase) (CA2
81).bin █████ 90%████ OK
Extracting /content/ROM/Astrowar (Unknown).bin
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████ 90%████ OK
Extracting /content/ROM/Bobby Is Going Home (1983) (Bit Corporation) (PG20
6).bin █████ 90%████ OK
Extracting /content/ROM/Burning Desire (1982) (PlayAround - JHM) (202).bin
████ 90%████ OK
Extracting /content/ROM/Cathouse Blues (1982) (PlayAround - JHM) (201).bin
████ 90%████ OK
Extracting /content/ROM/Challenge (Zellers).bin
████ 90%████ OK
Extracting /content/ROM/Crazy Ski (2600 Screen Search Console) (Jone Yuan T
elephonic Enterprise Co).bin █████ 90%████ OK
Extracting /content/ROM/Dancing Plate (1982) (Bit Corporation) (PG205).bin
████ 90%████ OK
Extracting /content/ROM/Dice Puzzle (1983) (Panda) (106).bin
████ 90%████ OK
Extracting /content/ROM/End of the World, The (2600 Screen Search Console)
(Jone Yuan Telephonic Enterprise Co).bin █████ 90%████ OK
Extracting /content/ROM/Fatal Run (Ultimate Driving) (1989) (Atari - Sculpt
ured Software, Steve Aguirre) (CX26162) (Prototype).bin █████ 90%████ 0
K
Extracting /content/ROM/Frisco (Unknown).bin
████ 90%████ OK
Extracting /content/ROM/Go Go Home (Unknown).bin
████ 90%████ OK
Extracting /content/ROM/Great Escape (AKA Asteroid Fire) (1983) (Bomb - Onb
ase) (CA282).bin █████ 90%████ OK
Extracting /content/ROM/IQ 180 (2600 Screen Search Console) (Jone Yuan Tele
phonic Enterprise Co).bin █████ 90%████ OK
Extracting /content/ROM/Klax (08-18-1990) (Atari - Axlon, Steve DeFrisco)
(CX26192) (Prototype).bin █████ 90%████ OK
Extracting /content/ROM/Knight on the Town (1982) (PlayAround - JHM) (203).
bin █████ 90%████ OK
Extracting /content/ROM/Lilly Adventure (Unknown).bin
████ 90%████ OK
Extracting /content/ROM/Mission 3,000 A.D. (1983) (Bit Corporation) (PG20
7).bin █████ 90%████ OK
Extracting /content/ROM/Mr. Postman (1983) (Bit Corporation) (PG209).bin
████ 90%████ OK
Extracting /content/ROM/Nightmare (1983) (Sancho - Tang's Electronic Co.)
(TEC004).bin █████ 90%████ OK
Extracting /content/ROM/Nuts (Unknown).bin
████ 90%████ OK
Extracting /content/ROM/Open, Sesame! (1982) (Bit Corporation) (PG204).bin
████ 90%████ OK
Extracting /content/ROM/Phantom Tank (1982) (Bit Corporation) (PG203).bin
████ 90%████ OK
Extracting /content/ROM/Pharaoh's Curse (Unknown).bin
████ 91%████ OK
Extracting /content/ROM/Racing Car (Unknown).bin
████ 91%████ OK
Extracting /content/ROM/Radar (AKA Exocet) (Zellers).bin
████ 91%████ OK
Extracting /content/ROM/Save Our Ship (Unknown).bin
████ 91%████ OK
Extracting /content/ROM/Scuba Diver (AKA Skindiver) (Zellers).bin
████ 91%████ OK

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Extracting /content/ROM/Sea Hawk (AKA Seahawk) (Zellers).bin
████ 91%████ OK
Extracting /content/ROM/Sea Monster (1982) (Bit Corporation) (PG201).bin
████ 91%████ OK
Extracting /content/ROM/Snail Against Squirrel (1983) (Bit Corporation) (PG
208).bin █████ 91%████ OK
Extracting /content/ROM/Space Tunnel (1982) (Bit Corporation) (PG202).bin
████ 91%████ OK
Extracting /content/ROM/Spider Maze (AKA Inca Gold) (1982) (K-Tel Vision).b
in █████ 91%████ OK
Extracting /content/ROM/Time Warp (1982) (Funvision - Fund. International C
o.).bin █████ 91%████ OK
Extracting /content/ROM/Topy (2600 Screen Search Console) (Jone Yuan Teleph
onic Enterprise Co).bin █████ 91%████ OK
Extracting /content/ROM/Wall-Defender (AKA Wall Break) (1983) (Bomb - Onbas
e) (CA285).bin █████ 91%████ OK
Extracting /content/ROM/Z-Tack (AKA Base Attack) (1983) (Bomb - Onbase) (CA
283).bin █████ 91%████ OK
Extracting /content/ROM/3-D Tic-Tac-Toe (1980) (Atari, Carol Shaw) (CX2618,
CX2618P) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Action Man - Action Force (AKA G.I. Joe - Cobra Str
ike) (Paddle) (1983) (Parker Brothers, John Emerson) (931511) (PAL).bin
████ 91%████ OK
Extracting /content/ROM/Activision Decathlon, The - Zehnkampf (1983) (Activ
ision, David Crane - Ariola) (EAZ-030, EAZ-030-04B, EAZ-030-04I - 711 030-72
5) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Adventure (1980) (Atari, Warren Robinett) (CX2613,
CX2613P) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Adventures on GX-12 (AKA Adventures of TRON) (1988)
(Telegames) (4317 A009) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Air-Sea Battle - Air Sea Battle (Anti-Aircraft) (19
77) (Atari, Larry Kaplan) (CX2602, CX2602P) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Airlock (1983) (Gameworld) (133-004) (PAL).bin
████ 91%████ OK
Extracting /content/ROM/Alpha Beam with Ernie (Alpha Beam) (Kid's Controlle
r) (1983) (Atari - CCW, Michael Callahan, Preston Stuart) (CX26103) (PAL).bi
n █████ 91%████ OK
Extracting /content/ROM/Amidar (1982) (Parker Brothers, Ed Temple) (931504)
(PAL).bin █████ 91%████ OK
Extracting /content/ROM/Armor Ambush (1988) (Telegames) (PAL).bin
████ 91%████ OK
Extracting /content/ROM/Artillery Duel (1983) (Xonox - K-Tel Software - Act
ion Graphics, Michael Schwartz, David Thiel) (6230, 7210, 06004, 99004) (PA
L).bin █████ 91%████ OK
Extracting /content/ROM/Asterix (AKA Taz) (1984) (Atari, Jerome Domurat, St
eve Woita) (CX2696) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart) (CX2649, CX2
649P) (PAL) [no copyright].bin █████ 91%████ OK
Extracting /content/ROM/Asteroids (1981) (Atari, Brad Stewart) (CX2649, CX2
649P) (PAL).bin █████ 91%████ OK
Extracting /content/ROM/Astroblast (Paddle) (1988) (Telegames) (PAL).bin
████ 91%████ OK
Extracting /content/ROM/Atlantis (Lost City of Atlantis) (1982) (Imagic, De
nnis Koble) (720103-2A, IA3203P, EIX-010-04I) (PAL).bin █████ 91%████ O
K
Extracting /content/ROM/Backgammon (Paddle) (1979) (Atari, Craig Nelson) (C

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X2617, CX2617P) (PAL).bin      91% OK
Extracting /content/ROM/Bank Heist (Unknown) (PAL).bin
91% OK
Extracting /content/ROM/Barnstorming - Die tollkeuhnen Flieger (1982) (Acti
vision, Steve Cartwright - Ariola) (EAX-013, PAX-013 - 711 013-720) (PAL).bi
n      91% OK
Extracting /content/ROM/Baseball (AKA Super Challenge Baseball) (1988) (Tel
egames) (5665 A016) (PAL).bin      91% OK
Extracting /content/ROM/Basic Math (Math Pack) (1977) (Atari, Gary Palmer)
(CX2661) (PAL).bin      91% OK
Extracting /content/ROM/BASIC Programming (Keyboard Controller) (1979) (Ata
ri, Warren Robinett) (CX2620, CX2620P) (PAL).bin      91% OK
Extracting /content/ROM/Basketball (1978) (Atari, Alan Miller) (CX2624, CX2
624P) (PAL).bin      91% OK
Extracting /content/ROM/Battlezone (1983) (Atari - GCC, Mike Feinstein, Bra
d Rice) (CX2681, CX2681P) (PAL).bin      91% OK
Extracting /content/ROM/Beamrider (1984) (Activision - Cheshire Engineerin
g, David Rolfe, Larry Zwick) (EAX-037-04, EAX-037-04I) (PAL).bin      9
1% OK
Extracting /content/ROM/Beat 'Em & Eat 'Em (Paddle) (1982) (Mystique - Amer
ican Multiple Industries - JHM) (PAL).bin      91% OK
Extracting /content/ROM/Bermuda Triangle (1983) (Gameworld, J. Ray Dettlin
g) (133-007) (PAL).bin      91% OK
Extracting /content/ROM/Berzerk (1982) (Atari, Dan Hitchens) (CX2650) (PA
L).bin      91% OK
Extracting /content/ROM/Big Bird's Egg Catch (Grover's Egg Catch) (Kid's Co
ntroller) (1983) (Atari - CCW, Christopher H. Omarzu) (CX26104) (PAL).bin
91% OK
Extracting /content/ROM/Blackjack (Gambling) (Paddle) (1977) (Atari, Bob Wh
itehead) (CX2651) (PAL).bin      91% OK
Extracting /content/ROM/Blueprint (1983) (CBS Electronics, Tom DiDomenico)
(4L2477, 4L2482, 4L2485, 4L4171) (PAL).bin      91% OK
Extracting /content/ROM/BMX Air Master (1989) (TNT Games - Sculptured Softw
are, Adam Clayton) (26192) (PAL).bin      91% OK
Extracting /content/ROM/Bogey Blaster (AKA Air Raiders) (1988) (Telegames)
(5861 A030) (PAL).bin      91% OK
Extracting /content/ROM/Boing! (Bubbles, Soap Suds, The Emphysema Game) (19
83) (First Star Software, Alex Leavens, Shirley Ann Russell) (PAL).bin
91% OK
Extracting /content/ROM/Bowling (1979) (Atari, Larry Kaplan) (CX2628, CX262
8P) (PAL).bin      91% OK
Extracting /content/ROM/Boxing - Box-Champion (1980) (Activision, Bob White
head - Ariola) (EAG-002, EAG-002-04I, PAG-002 - 711 002-715) (PAL).bin
91% OK
Extracting /content/ROM/Brain Games (Keyboard Controller) (1978) (Atari, La
rry Kaplan) (CX2664, CX2664P) (PAL).bin      91% OK
Extracting /content/ROM/Breakout (Paddle) (1978) (Atari, Brad Stewart) (CX2
622, CX2622P) (PAL).bin      91% OK
Extracting /content/ROM/Bridge (1980) (Activision, Larry Kaplan - Ariola)
(EAX-006, PAX-006 - 771 006-720) (PAL).bin      91% OK
Extracting /content/ROM/Buck Rogers - Planet of Zoom (1983) (SEGA - Teldec)
(005-01 - 3.60104 VG) (PAL).bin      91% OK
Extracting /content/ROM/Bugs (Paddle) (1983) (Gameworld) (133-005) (PAL).bi
n      91% OK
Extracting /content/ROM/Bump 'n' Jump (1988) (Telegames) (7045 A015) (PAL).
bin      91% OK

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Extracting /content/ROM/Bumper Bash (Paddle) (1983) (Spectravideo, David Lubar) (SA-218, SA-218C) (PAL).bin 92% OK

Extracting /content/ROM/Cakewalk - Alarm in der Backstube (Bakery) (1983) (CommaVid, Irwin Gaines - Ariola) (CM-008 - 712 008-720) (PAL).bin 92% OK

Extracting /content/ROM/California Games (1987) (Epyx, Steven A. Baker, Peter Engelbrite) (80561-00286) (PAL).bin 92% OK

Extracting /content/ROM/Canyon Bomber (Unknown) (PAL).bin 92% OK

Extracting /content/ROM/Carnival (1983) (CBS Electronics - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen) (4L1717, 4L1718, 4L1719, 4L2277) (PAL).bin 92% OK

Extracting /content/ROM/Casino (Paddle) (1979) (Atari, Bob Whitehead) (CX2652, CX2652P) (PAL).bin 92% OK

Extracting /content/ROM/Centipede (1982) (Atari - GCC) (CX2676) (Prototype) (PAL).bin 92% OK

Extracting /content/ROM/Centipede (1983) (Atari - GCC) (CX2676) (PAL).bin 92% OK

Extracting /content/ROM/Challenge of.... Nexar, The (1982) (Spectravision - Spectravideo - Sirius Software, David Lubar) (SA-206) (PAL).bin 92% OK

Extracting /content/ROM/Championship Soccer (1980) (Atari, Steve Wright) (CX2616P) (PAL).bin 92% OK

Extracting /content/ROM/Checkers (32 in 1) (1988) (Atari) (CX26163P) (PAL).bin 92% OK

Extracting /content/ROM/China Syndrome (1982) (Spectravision - Spectravideo) (SA-205) (PAL).bin 92% OK

Extracting /content/ROM/Chopper Command - Captain Helicopter (1982) (Activision, Bob Whitehead - Ariola) (EAX-015, EAX-015-04I - 711 015-725) (PAL).bin 92% OK

Extracting /content/ROM/Circus Atari (Paddle) (1980) (Atari, Mike Lorenzen) (CX2630, CX2630P) (PAL).bin 92% OK

Extracting /content/ROM/Codebreaker (Numbers) (Keyboard Controller) (1978) (Atari) (CX2643) (PAL).bin 92% OK

Extracting /content/ROM/Combat (Tank) (1977) (Atari, Joe Decuir, Larry Kaplan, Steve Mayer, Larry Wagner) (CX2601, CX2601P) (PAL).bin 92% OK

Extracting /content/ROM/Commando (1988) (Activision - Imagineering, Mike Reid) (EAK-043-04I) (PAL).bin 92% OK

Extracting /content/ROM/Commando (AKA Front Line) (Edu Games - Edu Juegos) (PAL).bin 92% OK

Extracting /content/ROM/Commando Raid (1983) (Carrere Video - JWDA, Todd Marshall, Wes Trager, Henry Will IV - Teldec - Prism) (USC1004) (PAL).bin 92% OK

Extracting /content/ROM/Communist Mutants from Space (Galactic Egg) (1982) (Starpath Corporation, Stephen H. Landrum) (2) (AR-4101) (PAL).bin 92% OK

Extracting /content/ROM/CompuMate (1983) (Spectravideo - Universum) (SV-010) (PAL).bin 92% OK

Extracting /content/ROM/Condor Attack (1982) (Ultravision) (1043) (PAL).bin 92% OK

Extracting /content/ROM/Congo Bongo (1983) (SEGA - Beck-Tech, Steve Beck, Phat Ho - Teldec) (006-01 - 3.60105 VG) (PAL).bin 92% OK

Extracting /content/ROM/Cookie Monster Munch (Cookie Monster's Maze, Cookie Monster's Garden) (Kid's Controller) (1983) (Atari - CCW, Gary Stark) (CX26102) (PAL).bin 92% OK

Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (720104-2A, IA3204P, EIX-008-04I) (PAL) [selectable starfield].bin 92% OK

Extracting /content/ROM/Cosmic Ark (Reaction) (1982) (Imagic, Rob Fulop) (720104-2A, IA3204P, EIX-008-04I) (PAL).bin 92% OK

Extracting /content/ROM/Cosmic Creeps (Space Maze, Spaze Maze) (1982) (Telesys, Don 'Donyo' Ruffcorn) (1002) (PAL).bin 92% OK

Extracting /content/ROM/Cosmic Swarm - Angriff der Termiten (Termite) (1982) (CommaVid, John Bronstein - Ariola) (CM-003 - 712 003-720) (PAL).bin 92% OK

Extracting /content/ROM/Crackpots (Unknown) (PAL).bin 92% OK

Extracting /content/ROM/Crash Dive (Voyage to the Bottom of the Sea) (1983) (20th Century Fox Video Games, Bill Aspromonte) (11131) (PAL).bin 92% OK

Extracting /content/ROM/Criminal Pursuit (AKA A Mysterious Thief) (1983) (Suntek) (SS-036) (PAL).bin 92% OK

Extracting /content/ROM/Cross Force - Kreuzfeuer (Cross Fire) (1982) (Spectravision - Spectravideo - Quelle) (SA-203 - 413.223 9) (PAL).bin 92% OK

Extracting /content/ROM/Crossbow (1988) (Atari - Imagineering, Dan Kitchen) (CX26139P) (PAL).bin 92% OK

Extracting /content/ROM/Crystal Castles (1984) (Atari, Michael Kosaka, Peter C. Niday, Robert Vieira) (CX26110) (PAL).bin 92% OK

Extracting /content/ROM/Custer's Revenge (1982) (Mystique - American Multiple Industries - JHM) (PAL).bin 92% OK

Extracting /content/ROM/Dark Chambers (Dungeon, Dungeon Masters) (1989) (Atari - Sculptured Software, Adam Clayton) (CX26151, CX26151P) (PAL).bin 92% OK

Extracting /content/ROM/Deadly Discs (AKA TRON - Deadly Discs) (1988) (Telegames) (PAL).bin 92% OK

Extracting /content/ROM/Defender (1982) (Atari, Robert C. Polaro, Alan J. Murphy) (CX2609, CX2609P) (PAL).bin 92% OK

Extracting /content/ROM/Demolition Herby (1983) (Telesys, Don Ruffcorn) (1006) (PAL).bin 92% OK

Extracting /content/ROM/Demon Attack (Death from Above) (1982) (Imagic, Rob Fulop) (720101-2B, IA3200P, EIX-006-04I) (PAL).bin 92% OK

Extracting /content/ROM/Demons to Diamonds (Hot Rox) (Paddle) (1982) (Atari, Alan J. Murphy, Nick 'Sandy Maiwald' Turner) (CX2615) (PAL).bin 92% OK

Extracting /content/ROM/Der moderne Ritter - Mr. T (AKA Fast Eddie) (1983) (Quelle - Otto Versand) (700.223 1 - 781627) (PAL).bin 92% OK

Extracting /content/ROM/Desert Falcon (Nile Flyer, Sphinx) (1987) (Atari - Bobco, Robert C. Polaro) (CX26140, CX26140P) (PAL).bin 92% OK

Extracting /content/ROM/Diagnostic Test Cartridge 2.6P (1982) (Atari) (TE016643) (PAL) (4K).bin 92% OK

Extracting /content/ROM/Dig Dug (1983) (Atari - GCC, Ava-Robin Cohen, Douglas B. Macrae) (CX2677, CX2677P) (PAL).bin 93% OK

Extracting /content/ROM/Dodge 'Em (Head On) (1980) (Atari, Carla Meninsky) (CX2637, CX2637P) (PAL) [fixed].bin 93% OK

Extracting /content/ROM/Dodge 'Em (Head On) (1980) (Atari, Carla Meninsky) (CX2637, CX2637P) (PAL).bin 93% OK

Extracting /content/ROM/Donald Duck's Speedboat (Donald Duck's Sailboat Regatta) (04-18-1983) (Atari, Dave Joly, Suki Lee) (CX26108) (Prototype) (PAL).bin 93% OK

Extracting /content/ROM/Donkey Kong (1983) (CBS Electronics - Woodside Desi

gn Associates - Imaginative Systems Software, Garry Kitchen) (4L1700, 4L1701, 4L1702, 4L1802, 4L2274) (PAL).bin 93% OK

Extracting /content/ROM/Donkey Kong Junior (1983) (CBS Electronics - Woodside Design Associates, Harley H. Puthuff Jr.) (4L1802) (PAL).bin 93% OK

Extracting /content/ROM/Double Dragon (1989) (Activision - Imagineering, Donald Hahn, Dan Kitchen) (EAK-050-04) (PAL).bin 93% OK

Extracting /content/ROM/Double Dunk (Super Basketball) (1989) (Atari, Matthew L. Hubbard) (CX26159) (PAL).bin 93% OK

Extracting /content/ROM/Dragonfire (Cheese) (1982) (Imagic, Bob Smith) (720 020-2A, IA3611P) (PAL).bin 93% OK

Extracting /content/ROM/Dragonstomper (Excalibur) (1982) (Starpath Corporation, Stephen H. Landrum) (6) (AR-4400) (PAL).bin 93% OK

Extracting /content/ROM/Dragster - Dragster Rennen (Drag Strip) (1980) (Activision, David Crane - Ariola) (EAG-001, PAG-001, EAG-001-04B, EAG-001-04I - 711 001-715) (PAL).bin 93% OK

Extracting /content/ROM/Dumbo's Flying Circus (Dumbo Flies Home) (07-11-1983) (Atari, Jerome Domurat, Peter C. Niday) (CX26115) (Prototype) (PAL).bin 93% OK

Extracting /content/ROM/E.T. - The Extra-Terrestrial (1982) (Atari, Jerome Domurat, Howard Scott Warshaw) (CX2674) (PAL).bin 93% OK

Extracting /content/ROM/Earth Dies Screaming, The (Unknown) (PAL).bin 93% OK

Extracting /content/ROM/Eggomania - Eierregen (Paddle) (1983) (Carrere Video - JWDA, Todd Marshall, Robin McDaniel, Wes Trager, Henry Will IV - Teldec - Prism) (USC2003) (PAL).bin 93% OK

Extracting /content/ROM/Encounter at L-5 (Megalon Invasion) (Paddle) (1983) (Gameworld) (133-001) (PAL).bin 93% OK

Extracting /content/ROM/Enduro - Transamerika-Rennen (1983) (Activision, Larry Miller - Ariola) (EAX-026, EAX-026-04B, EAX-026-04I - 711 026-725) (PAL).bin 93% OK

Extracting /content/ROM/Escape from the Mindmaster (Labyrinth) (1982) (Starpath Corporation, Dennis Caswell) (5) (AR-4200) (PAL).bin 93% OK

Extracting /content/ROM/Espial (1984) (Tigervision - Teldec) (7-012 - 3.600 16 VC) (PAL).bin 93% OK

Extracting /content/ROM/F-14 Tomcat (1988) (Absolute Entertainment, Dan Kitchen) (PAL).bin 93% OK

Extracting /content/ROM/Fantastic Voyage (Unknown) (PAL).bin 93% OK

Extracting /content/ROM/Fast Food (1982) (Telesys, Don Ruffcorn, Jack Woodman) (1003) (PAL).bin 93% OK

Extracting /content/ROM/Fathom (Scuba) (1983) (Imagic, Wilfredo Aguilar, Michael Becker, Rob Fulop) (720111-2A, 13205) (PAL).bin 93% OK

Extracting /content/ROM/Fire Fighter (Fire Fighters) (1982) (Imagic, Brad Stewart) (720105-2A, IA3400P, EIX-005-04I) (PAL).bin 93% OK

Extracting /content/ROM/Fireball (Frantic) (Paddle) (1982) (Starpath Corporation, Scott Nelson) (3) (AR-4300) (PAL).bin 93% OK

Extracting /content/ROM/Firebug (AKA Spinning Fireball) (1983) (Suntek) (SS-028) (PAL).bin 93% OK

Extracting /content/ROM/Fishing Derby - Schneller als der Hai (1980) (Activision, David Crane - Ariola) (EAG-004, PAG-004 - 711 004-715) (PAL).bin 93% OK

Extracting /content/ROM/Flag Capture (32 in 1) (1988) (Atari, Jim Huether) (CX26163P) (PAL).bin 93% OK

Extracting /content/ROM/Flash Gordon (Unknown) (PAL).bin

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0000 93%000000 OK
Extracting /content/ROM/Football (AKA Super Challenge Football) (1988) (Tel
egames) (5658 A088) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Football (Unknown) (PAL).bin
0000 93%000000 OK
Extracting /content/ROM/Frankenstien's Monster (1983) (Gameworld, J. Ray De
tting) (133-008) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Freeway - Das verrueckte Huhn (1981) (Activision, D
avid Crane - Ariola) (EAG-009, PAG-009 - 711 009-720) (PAL).bin 0000 9
3%000000 OK
Extracting /content/ROM/Frogger (1982) (Parker Brothers, Ed English, David
Lamkins) (931502) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Frogger II - Threedeep! (1984) (Parker Brothers, M
ark Lesser) (PB5590) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Frogs and Flies (1988) (Telegames) (PAL).bin
0000 93%000000 OK
Extracting /content/ROM/Frostbite - Expedition ins Eis (Iceman) (1983) (Act
ivision, Steve Cartwright - Ariola) (EAX-031, EAX-031-04B - 711 031-717) (PA
L).bin 0000 93%000000 OK
Extracting /content/ROM/Galaxian (1983) (Atari - GCC, Mark Ackerman, Tom Ca
lderwood, Glenn Parker) (CX2684, CX2684P) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Gangster Alley - Gangster Ruine (1982) (Spectravisi
on - Spectravideo - Quelle) (SA-201 - 412.783 3) (PAL).bin 0000 93%000000
OK
Extracting /content/ROM/Gas Hog - Piraten Schiff (1983) (Spectravideo, Mark
Turmell - Quelle) (SA-217, SA-217C - 413.723 8) (PAL).bin 0000 93%000000
OK
Extracting /content/ROM/Ghost Manor (1983) (Xonox - K-Tel Software - Beck-T
ech, Steve Beck) (6210, 06002, 06004, 99002) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Ghostbusters (1985) (Activision, David Crane, Dan K
itchen) (EAG-108-04, EAZ-108-04B) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Glacier Patrol (1988) (Telegames - VSS, Ed Salvo)
(5665 A016) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Golf (Championship Golf) (1980) (Atari, Tom Reuter d
ahl) (CX2634, CX2634P) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Gopher - Vorsicht Wühlmaus! (1983) (Carrere Video -
JWDA, Sylvia Day, Todd Marshall, Robin McDaniel, Henry Will IV - Teldec - Pr
ism) (USC2001) (PAL).bin 0000 93%000000 OK
Extracting /content/ROM/Gorf (1982) (CBS Electronics - Roklan, Joe Gaucher,
Dan Kurczewski, Alex Leavens, Kathy Von) (4L1751, 4L1752, 4L1753, 4L2275) (P
AL).bin 0000 94%000000 OK
Extracting /content/ROM/Grand Prix (1982) (Activision, David Crane - Ariol
a) (EAX-014, PAX-014, EAX-014-04B, EAX-014-04I - 711 014-720) (PAL).bin
0000 94%000000 OK
Extracting /content/ROM/Gyruss (1984) (Parker Brothers - Roklan, Joe Gauche
r) (PB5080) (PAL).bin 0000 94%000000 OK
Extracting /content/ROM/H.E.R.O. - Helicopter-Held (1984) (Activision, John
Van Ryzin - Ariola) (EAX-036-04, EAZ-036-04B, EAZ-036-04I - 711 036-720) (PA
L).bin 0000 94%000000 OK
Extracting /content/ROM/Hangman (1978) (Atari, Alan Miller) (CX2662P) (PA
L).bin 0000 94%000000 OK
Extracting /content/ROM/Haunted House (Mystery Mansion, Graves' Manor, Nigh
tmare Manor) (1982) (Atari, James Andreasen) (CX2654) (PAL).bin 0000 9
4%000000 OK
Extracting /content/ROM/Homerun - Horrormrun (32 in 1) (1988) (Atari, Bob Wh
itehead) (CX26163P) (PAL).bin 0000 94%000000 OK

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Extracting /content/ROM/Human Cannonball (1979) (Atari) (CX2627, CX2627P)
(PAL).bin      94% OK
Extracting /content/ROM/Hunt & Score (Keyboard Controller) (1978) (Atari, A
lan Miller) (CX2642) (PAL).bin      94% OK
Extracting /content/ROM/Ice Hockey - Eishockey (1981) (Activision, Alan Mil
ler - Ariola) (EAG-012-04I, EAX-012, EAX-012-04B - 711 012-720) (PAL).bin
94% OK
Extracting /content/ROM/Ikari Warriors (1991) (Atari - Imagineering, Dan Ki
tchen) (CX26177) (PAL).bin      94% OK
Extracting /content/ROM/Imagic Selector ROM (1982) (Imagic) (PAL).bin
94% OK
Extracting /content/ROM/Indy 500 (Race Car) (Driving Controller) (1977) (At
ari, Carla Meninsky, Ed Riddle) (CX2611, CX2611P) (PAL).bin      9
4% OK
Extracting /content/ROM/Infernal Tower (AKA Towering Inferno) (1983) (Carre
re Video - Western Technologies, Jeff Corsiglia, Paul Allen Newell, Tom Slop
er - Teldec - Prism) (USC1009) (PAL).bin      94% OK
Extracting /content/ROM/Infiltrate - Nid d'espions (1982) (Apollo - Games b
y Apollo - RCA Video Jeux) (AP-2006) (PAL).bin      94% OK
Extracting /content/ROM/International Soccer (1988) (Telegames) (5687 A279)
(PAL).bin      94% OK
Extracting /content/ROM/Jawbreaker (1982) (Tigervision, John Harris - Telde
c) (7-002 - 3.60002 VE) (PAL).bin      94% OK
Extracting /content/ROM/Journey Escape - Rock 'n' Roll Escape (1983) (Gamew
orld, J. Ray Dettling) (133-006) (PAL).bin      94% OK
Extracting /content/ROM/Joust (1983) (Atari - GCC, Mike Feinstein, Kevin Os
born) (CX2691, CX2691P) (PAL).bin      94% OK
Extracting /content/ROM/Jr. Pac-Man (1986) (Atari - GCC, Ava-Robin Cohen)
(CX26123, CX26123P) (PAL).bin      94% OK
Extracting /content/ROM/Jungle Hunt (1983) (Atari - GCC, John Allred, Mike
Feinstein) (CX2688, CX2688P) (PAL).bin      94% OK
Extracting /content/ROM/Kaboom! - Schneller als der Knall (Paddle) (1981)
(Activision, Larry Kaplan, David Crane - Ariola) (EAG-010, PAG-010 - 711 010
-720) (PAL).bin      94% OK
Extracting /content/ROM/Kangaroo (1983) (Atari - GCC, Kevin Osborn) (CX268
9, CX2689P) (PAL).bin      94% OK
Extracting /content/ROM/Karate (1982) (Funvision - Fund. International Co.)
(PAL).bin      94% OK
Extracting /content/ROM/Keystone Kapers - Raueber und Gendarm (1983) (Activ
ision, Garry Kitchen - Ariola) (EAX-025, EAX-025-04I - 711 025-725) (PAL).bi
n      94% OK
Extracting /content/ROM/Killer Satellites (1983) (Starpeth Corporation, Kev
in Norman) (7) (AR-4103) (PAL).bin      94% OK
Extracting /content/ROM/King Kong (1982) (Tigervision - Software Electronic
s Corporation, Karl T. Olinger - Teldec) (7-001 - 3.60001 VE) (PAL) [a].bin
94% OK
Extracting /content/ROM/King Kong (1982) (Tigervision - Software Electronic
s Corporation, Karl T. Olinger - Teldec) (7-001 - 3.60001 VE) (PAL).bin
94% OK
Extracting /content/ROM/Knight on the Town (1982) (PlayAround - JHM) (203)
(PAL).bin      94% OK
Extracting /content/ROM/Krull (Edu Games - Edu Juegos) (PAL).bin
94% OK
Extracting /content/ROM/Kung-Fu Master (1987) (Activision - Imagineering, D
an Kitchen, Garry Kitchen) (EAX-039-04B, EAX-039-04I) (PAL).bin      9
4% OK

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Extracting /content/ROM/Laser Blast - Duell im Weltall (Lazer) (1981) (Activision, David Crane - Ariola) (EAG-008, PAG-008, EAG-008-04I - 711 008-720) (PAL).bin 94% OK

Extracting /content/ROM/Laser Gates (AKA Innerspace) (1983) (Imagic, Dan Oliver) (720118-2A, 13208, EIX-007-04I) (PAL).bin 94% OK

Extracting /content/ROM/Lock 'n' Chase (1988) (Telegames) (PAL).bin 94% OK

Extracting /content/ROM/Los Angeles 1984 Games (AKA Track and Field) (Track & Field Controller) (1984) (Atari - GCC, Jaques Hugon, Seth Lipkin) (CX26125) (Prototype) (PAL).bin 94% OK

Extracting /content/ROM/Lost Luggage - La valise piégée (Airport Mayhem) (1982) (Apollo - Games by Apollo, Larry Minor, Ernie Runyon, Ed Salvo - RCA Video Jeux) (AP-2004) (PAL).bin 94% OK

Extracting /content/ROM/M.A.D. (1983) (Carrere Video - Western Technologies, John Hall - Teldec - Prism) (USC1012) (PAL).bin 94% OK

Extracting /content/ROM/M.A.S.H (1983) (20th Century Fox Video Games, Frank Cohen, Douglas 'Dallas North' Neubauer) (11111) (PAL).bin 94% OK

Extracting /content/ROM/Mangia' (1983) (Spectravideo) (SA-212) (PAL).bin 94% OK

Extracting /content/ROM/Marauder (1982) (Tigervision, Rorke Weigandt - Teldec) (7-005 - 3.60004 VE) (PAL).bin 94% OK

Extracting /content/ROM/Marine Wars (1983) (Gakken) (011) (PAL).bin 94% OK

Extracting /content/ROM/Mario Bros. (1983) (Atari, Dan Hitchens, Mimi Nyden) (CX2697, CX2697P) (PAL).bin 94% OK

Extracting /content/ROM/Master Builder - Super Baumeister (1983) (Spectravideo - Quelle) (SA-210 - 413.582 8) (PAL).bin 94% OK

Extracting /content/ROM/Math Gran Prix (Math Game) (1982) (Atari, Suki Lee) (CX2658) (PAL).bin 94% OK

Extracting /content/ROM/Maze Craze - A Game of Cops 'n Robbers (The Maze) (1980) (Atari, Richard Maurer) (CX2635, CX2635P) (PAL).bin 94% OK

Extracting /content/ROM/Mega Force (1982) (20th Century Fox Video Games, Douglas 'Dallas North' Neubauer) (11105) (PAL) [a].bin 94% OK

Extracting /content/ROM/Mega Force (1982) (20th Century Fox Video Games, Douglas 'Dallas North' Neubauer) (11105) (PAL).bin 94% OK

Extracting /content/ROM/MegaMania - A Space Nightmare - Ein Alptraum im Weltall (1982) (Activision, Steve Cartwright - Ariola) (EAX-017, EAX-017-04I - 711 017-720) (PAL).bin 94% OK

Extracting /content/ROM/Midnight Magic (Pinball Wizard) (1986) (Atari, Glenn Axworthy) (CX26129) (PAL).bin 94% OK

Extracting /content/ROM/Millipede (1984) (Atari - GCC) (CX26118) (Prototype) (PAL).bin 95% OK

Extracting /content/ROM/Millipede (1984) (Atari, Jerome Domurat, Andrew Fuchs, Dave Staugas, Robert Vieira) (CX26118, CX26118P) (PAL).bin 95% OK

Extracting /content/ROM/Miner 2049er - Starring Bounty Bob (1983) (Tigervision - Teldec) (7-008 - 3.60006 VG) (PAL).bin 95% OK

Extracting /content/ROM/Miner 2049er Volume II (1983) (Tigervision - Teldec) (7-011 - 3.60015 VG) (PAL).bin 95% OK

Extracting /content/ROM/Mines of Minos - Im Labyrinth des Roboters (1982) (CommaVid, Irwin Gaines - Ariola) (CM-005 - 712 005-720) (PAL).bin 95% OK

Extracting /content/ROM/Miniature Golf (1979) (Atari, Tom Reuterdaahl) (CX2626, CX2626P) (PAL).bin 95% OK

Extracting /content/ROM/Missile Command (1981) (Atari, Rob Fulop) (CX2638) (PAL).bin 95% OK

Extracting /content/ROM/Moon Patrol (1983) (Atari - GCC, Mark Ackerman, Noe lie Alito) (CX2692, CX2692P) (PAL).bin 95% OK

Extracting /content/ROM/Moonsweeper (1983) (Imagic, Bob Smith) (720114-2A, 13207, EIZ-001-04I) (PAL).bin 95% OK

Extracting /content/ROM/MotoRodeo (Motor Olympics, Motor Rodeo) (1991) (Ata ri - Axlon, Steve DeFrisco) (CX26171) (PAL).bin 95% OK

Extracting /content/ROM/Mouse Trap (1983) (CBS Electronics - JWDA, Sylvia D ay, Todd Marshall, Robin McDaniel, Henry Will IV) (4L1818, 4L1819, 4L1820, 4 L1821) (PAL).bin 95% OK

Extracting /content/ROM/Mr. Do! (1983) (CBS Electronics - Individeo, Ed Eng lish) (4L4478) (PAL).bin 95% OK

Extracting /content/ROM/Ms. Pac-Man (1983) (Atari - GCC, Mark Ackerman, Gle nn Parker) (CX2675, CX2675P) (PAL).bin 95% OK

Extracting /content/ROM/Night Driver (Paddle) (1980) (Atari, Rob Fulop) (CX 2633, CX2633P) (PAL).bin 95% OK

Extracting /content/ROM/Night Stalker (AKA Dark Cavern) (1988) (Telegames) (PAL).bin 95% OK

Extracting /content/ROM/No Escape! (Escape from Argos) (1983) (Imagic, Mich ael Greene) (720055-2A, IA3312P) (PAL).bin 95% OK

Extracting /content/ROM/Obelix (1984) (Atari, Andrew Fuchs, Jeffrey Gusman, Dave Joly, Suki Lee) (CX26117) (PAL).bin 95% OK

Extracting /content/ROM/Octopus (AKA Name This Game) (1983) (Carrere Video - JWDA, Roger Booth, Sylvia Day, Todd Marshall, Robin McDaniel, Wes Trager, Henry Will IV - Teldec - Prism) (USC1007) (PAL).bin 95% OK

Extracting /content/ROM/Off the Wall (Bizarre Breakout, Peasant King, Zip 'n' Zap) (1989) (Atari - Axlon, John Vifian) (CX26168) (PAL).bin 9 5% OK

Extracting /content/ROM/Official Frogger, The (1983) (Starpeth Corporation, Stephen H. Landrum) (9) (AR-4105) (PAL).bin 95% OK

Extracting /content/ROM/Oink! - Das Schweinchen und der Wolf (1983) (Activi sion, Mike Lorenzen - Ariola) (EAX-023 - 711 023-720) (PAL).bin 9 5% OK

Extracting /content/ROM/Oscar's Trash Race (Kid's Controller) (1984) (Atari - CCW, Christopher H. Omarzu, Preston Stuart, Bruce Williams) (CX26101) (PA L).bin 95% OK

Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw) (CX263 9, CX2639P) (PAL) [no grid markers].bin 95% OK

Extracting /content/ROM/Othello (1981) (Atari, Ed Logg, Carol Shaw) (CX263 9, CX2639P) (PAL).bin 95% OK

Extracting /content/ROM/Outlaw (1978) (Atari, David Crane) (CX2605, CX2605 P) (PAL).bin 95% OK

Extracting /content/ROM/Pac-Man (1982) (Atari, Tod Frye) (CX2646) (PAL).bin 95% OK

Extracting /content/ROM/Party Mix - Bop a Buggy, Tug of War, Wizard's Keep, Down on the Line, Handcar (Paddle) (1983) (Starpeth Corporation, Dennis Casw ell) (10) (AR-4302) (PAL).bin 95% OK

Extracting /content/ROM/Pengo (1984) (Atari, Andrew Fuchs, Courtney Granne r, Jeffrey Gusman, Mark R. Hahn) (CX2690) (PAL).bin 95% OK

Extracting /content/ROM/Pete Rose Baseball (HES - Absolute Entertainment) (PAL).bin 95% OK

Extracting /content/ROM/Phantompanzer II (AKA Thunderground) (1983) (Quell e) (343.273 9) (PAL).bin 95% OK

Extracting /content/ROM/Phaser Patrol (1982) (Starpeth Corporation, Dennis Caswell) (1) (AR-4000, AR-4100) (PAL).bin 95% OK

Extracting /content/ROM/Phoenix (1983) (Atari - GCC, Mike Feinstein, John M racek) (CX2673, CX2673P) (PAL).bin 95% OK

Extracting /content/ROM/Picnic (Paddle) (1983) (Carrere Video - Western Technologies, Jeff Corsiglia, David Johnson, Tom Sloper - Teldec - Prism) (USC2 004) (PAL).bin 95% OK

Extracting /content/ROM/Pigs in Space - Starring Miss Piggy (1983) (Atari, Bill Aspromonte, Dave Joly, John Russell, Michael Sierchio, Robert Zdybel) (CX26114) (PAL).bin 95% OK

Extracting /content/ROM/Pitfall II - Lost Caverns (1984) (Activision, Steve Cartwright, David Crane - Ariola) (EAB-035-04 - 711 035-721) (PAL).bin 95% OK

Extracting /content/ROM/Pitfall! - Abenteuer im Urwald (Jungle Runner) (1982) (Activision, David Crane - Ariola) (EAX-018, EAX-018-04B, EAX-018-04I - 711 018-725) (PAL).bin 95% OK

Extracting /content/ROM/Planet Patrol - Planeten Patrouilie (1982) (Spectra vision - Spectravideo - Quelle) (SA-202 - 412.851 8) (PAL) [different spaces hip].bin 95% OK

Extracting /content/ROM/Planet Patrol - Planeten Patrouilie (1982) (Spectra vision - Spectravideo - Quelle) (SA-202 - 412.851 8) (PAL).bin 95% OK

Extracting /content/ROM/Plaque Attack - Schutzt Eure Zaehne (1983) (Activis ion, Steve Cartwright - Ariola) (EAX-027 - 711 027-722) (PAL).bin 95% OK

Extracting /content/ROM/Polaris (1983) (Tigervision, Robert H. O'Neil - Tel dec) (7-007 - 3.60005 VG) (PAL).bin 95% OK

Extracting /content/ROM/Pole Position (RealSports Driving) (1983) (Atari - GCC, John Allred, Douglas B. Macrae, Betty Ryan Tylko) (CX2694, CX2694P) (PAL).bin 95% OK

Extracting /content/ROM/Pooyan (1983) (Gakken) (001) (PAL).bin 96% OK

Extracting /content/ROM/Popeye (1983) (Parker Brothers - Roklan, Joe Gauche r) (931519) (PAL).bin 96% OK

Extracting /content/ROM/Pressure Cooker (1983) (Activision, Garry Kitchen - Ariola) (EAX-032 - 771 032-712) (PAL).bin 96% OK

Extracting /content/ROM/Private Eye (1984) (Activision, Bob Whitehead) (EAX -034-04, EAX-034-04I) (PAL).bin 96% OK

Extracting /content/ROM/Q-bert (1983) (Parker Brothers - Western Technologi es, Dave Hampton, Tom Sloper) (931517) (PAL).bin 96% OK

Extracting /content/ROM/Quest for Quintana Roo (1988) (Telegames - VSS) (60 57 A227) (PAL).bin 96% OK

Extracting /content/ROM/Quick Step! (Hop To It, Kwibble) (1983) (Imagic, Da ve Johnson) (720119-2A, 13211, EIX-004-04I) (PAL).bin 96% OK

Extracting /content/ROM/Rabbit Transit (Hopalong Catastrophe) (1983) (Starp ath Corporation, Brian McGhie) (8) (AR-4104) (PAL).bin 96% OK

Extracting /content/ROM/Racquetball (1982) (Apollo - Games by Apollo, Ed Sa lvo, Byron Parks) (AP-2003) (PAL).bin 96% OK

Extracting /content/ROM/Radar Lock (Dog Fight) (1989) (Atari, Douglas Neuba uer) (CX26176) (PAL).bin 96% OK

Extracting /content/ROM/Raft Rider (Unknown) (PAL).bin 96% OK

Extracting /content/ROM/Raiders of the Lost Ark (1982) (Atari, Jerome Domur at, Howard Scott Warshaw) (CX2659) (PAL).bin 96% OK

Extracting /content/ROM/Ram It (1983) (Telesys, Jim Rupp) (1004) (PAL).bin 96% OK

Extracting /content/ROM/Rampage! (1989) (Activision - Bobco, Robert C. Pola ro) (EAK-049-04B) (PAL).bin 96% OK

Extracting /content/ROM/Reactor (1983) (Parker Brothers, Charlie Heath) (931506) (PAL).bin 96% OK

Extracting /content/ROM/RealSports Boxing (1987) (Atari - Imagineering, Alex DeMeo) (CX26135, CX26135P) (PAL).bin 96% OK

Extracting /content/ROM/RealSports Soccer - Football - RealSports Soccer (1983) (Atari, Jerome Domurat, Michael Sierchio) (CX2667, CX2667P) (PAL).bin 96% OK

Extracting /content/ROM/RealSports Tennis (1983) (Atari - GCC) (CX2680, CX2680P) (PAL).bin 96% OK

Extracting /content/ROM/RealSports Volleyball (1982) (Atari, Jim Huether, Alan J. Murphy, Robert C. Polaro) (CX2666, CX2666P) (PAL).bin 96% OK

Extracting /content/ROM/Riddle of the Sphinx (1982) (Imagic, Rob Fulop, Bob Smith) (720106-2A, IA3600P, EIX-009-04I) (PAL).bin 96% OK

Extracting /content/ROM/River Raid - Jagdfliieger (1982) (Activision, Carol Shaw - Ariola) (EAX-020, EAX-020-04B, EAX-020-04I - 711 020-720) (PAL).bin 96% OK

Extracting /content/ROM/River Raid II (1988) (Activision - Imagineering, Dan Kitchen, David Lubar) (EAK-048-04, EAK-048-04B) (PAL).bin 96% OK

Extracting /content/ROM/Road Runner (1989) (Atari - Bobco, Robert C. Polaro) (CX2663) (PAL).bin 96% OK

Extracting /content/ROM/Robin Hood (1983) (Xonox - K-Tel Software - Computer Magic) (99005, 6220, 6250) (PAL).bin 96% OK

Extracting /content/ROM/Robot Tank - Rebellion der Roboter (Robotank) (1983) (Activision, Alan Miller - Ariola) (EAX-028 - 711 028-725) (PAL).bin 96% OK

Extracting /content/ROM/Roc 'n Rope (1984) (CBS Electronics - Individeo, Ed English) (4L1751) (PAL).bin 96% OK

Extracting /content/ROM/Room of Doom - Raum ohne Ausweg (1982) (CommaVid, Irwin Gaines - Ariola) (CM-004 - 712 004-720) (PAL).bin 96% OK

Extracting /content/ROM/S.A.C. Alert (Joyboard) (1983) (Amiga - Video Soft) (3135) (Prototype) (PAL).bin 96% OK

Extracting /content/ROM/Save Mary! (Saving Mary) (10-24-1991) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26178) (Prototype) (PAL).bin 96% OK

Extracting /content/ROM/Seaquest - Rettung aus der Tiefe (1983) (Activision, Steve Cartwright - Ariola) (EAX-022, EAX-022-04I - 711 022-720) (PAL).bin 96% OK

Extracting /content/ROM/Seawolf 3 (Submarine Commander Beta) (03-23-1981) (Sears Tele-Games, Marilyn Churchill, Matthew L. Hubbard) (CX2647 - 49-75142) (Prototype) (PAL).bin 96% OK

Extracting /content/ROM/Secret Quest (1989) (Atari - Axlon, Steve DeFrisco) (CX26170, CX26170P) (PAL).bin 96% OK

Extracting /content/ROM/Shark Attack (AKA Lochjaw) (1982) (Apollo - Games by Apollo, Steve Stringfellow) (AP-2005) (PAL).bin 96% OK

Extracting /content/ROM/Shooting Arcade (Light Gun) (01-16-1990) (Atari - Axlon, Tod Frye - Heuristica, Agustin Ortiz Valdiviezo) (CX26169) (Prototype) (PAL).bin 96% OK

Extracting /content/ROM/Sir Lancelot (1983) (Xonox - K-Tel Software - Product Guild, Anthony R. Henderson) (99006, 6220) (PAL).bin 96% OK

Extracting /content/ROM/Skate Boardin' (1987) (Absolute Entertainment, David Crane) (EAX-042-04B, EAX-042-04I) (PAL).bin 96% OK

Extracting /content/ROM/Skeet Shoot (1981) (Apollo - Games by Apollo, Ed Salvo) (AP-1001) (PAL) (4K).bin 96% OK

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Extracting /content/ROM/Skiing - Ski Weltcup (1980) (Activision, Bob Whitehead - Ariola) (EAG-005, PAG-005, EAG-005-04B - 711 005-715) (PAL).bin
████ 96%██████ OK
Extracting /content/ROM/Sky Diver (1979) (Atari, Jim Huether) (CX2629, CX2629P) (PAL).bin █████ 96%██████ OK
Extracting /content/ROM/Sky Jinks - Wettflug gegen die Zeit (1982) (Activision, Bob Whitehead - Ariola) (EAG-019, EAG-019-04I - 711 019-715) (PAL).bin
████ 96%██████ OK
Extracting /content/ROM/Sky Skipper (1983) (Parker Brothers) (931510) (PAL).bin █████ 96%██████ OK
Extracting /content/ROM/Slot Machine (1979) (Atari, David Crane) (CX2653P) (PAL).bin █████ 96%██████ OK
Extracting /content/ROM/Slot Racers (1978) (Atari, Warren Robinett) (CX2606, CX2606P) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Smurf - Schtroumpfs - Pitufu (1983) (CBS Electronics - JWDA, Todd Marshall, Robin McDaniel, Henry Will IV) (4L1767, 4L1768, 4L1769, 4L1770) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Sneak 'n Peek - Der Unsichtbare (1983) (Carrere Video - JWDA, Garry Kitchen, Paul Willson - Teldec - Prism) (USC1002) (PAL).bin
████ 97%██████ OK
Extracting /content/ROM/Snoopy and the Red Baron (1983) (Atari, Ed Bogas, Sam Comstock, Richard Dobbis, Nick 'Sandy Maiwald' Turner) (CX26111) (PAL).bin
████ 97%██████ OK
Extracting /content/ROM/Solar Fox (1983) (CBS Electronics, Bob Curtiss) (4L1852, 4L1853, 4L1854, 4L1855) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Solar Storm (Paddle) (1983) (Imagic, Wilfredo Aguilar, Michael Becker, Dennis Koble) (720113-2A, 13206) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Solaris (The Last Starfighter, Star Raiders II, Universe) (1986) (Atari, Douglas Neubauer, Mimi Nyden) (CX26136) (PAL).bin
████ 97%██████ OK
Extracting /content/ROM/Sorcerer's Apprentice (1983) (Atari, Dave Joly, Peter C. Niday, Robert Vieira) (CX26109) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space Attack (1988) (Telegames) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space Cavern - Les guerriers de l'espace (1982) (Apollo - Games by Apollo, Dan Oliver - RCA Video Jeux) (AP-2002) (PAL).bin
████ 97%██████ OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX2632, CX2632P) (PAL) [different speed and colors].bin █████ 97%██████ OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX2632, CX2632P) (PAL) [fixed].bin █████ 97%██████ OK
Extracting /content/ROM/Space Invaders (1980) (Atari, Richard Maurer) (CX2632, CX2632P) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space Jockey (1983) (Carrere Video - JWDA, Garry Kitchen - Teldec - Prism) (USC1001) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space Robot (Dimax - Sinmax) (SM8001) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space Shuttle - A Journey Into Space - Eine Reise ins All (1983) (Activision - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen - Ariola) (EAZ-033 - 711 033-725) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Space War (1978) (Atari, Ian Shepard) (CX2604, CX2604P) (PAL).bin █████ 97%██████ OK
Extracting /content/ROM/Spacechase (Space Attack) (1982) (Apollo - Games by Apollo, Ed Salvo, Byron Parks) (AP-2001) (PAL).bin █████ 97%██████ OK

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Extracting /content/ROM/SpaceMaster X-7 (Unknown) (PAL).bin
████ 97%████ OK
Extracting /content/ROM/Spectracube Invasion (AKA Immies & Aggies) (1983)
(Suntek) (SS-025) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Spider Fighter - Monster greifen an (1983) (Activis
ion, Larry Miller - Ariola) (EAX-021, EAX-021-04I - 711 021-720) (PAL).bin
████ 97%████ OK
Extracting /content/ROM/Spider-Man (1982) (Parker Brothers, David Lamkins,
Laura Nikolich) (931503) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Spike's Peak (1983) (Xonox - K-Tel Software - Beck-
Tech, Steve Beck) (6210, 7210, 06003. 99001) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Springer (1983) (Tigervision - Software Electronics
Corporation - Teldec - Prism) (7-006 - 3.60008 VG) (PAL).bin █████ 9
7%████ OK
Extracting /content/ROM/Sprint Master (Sprint 88, Sprint 2600) (1988) (Atar
i - Bobco, Robert C. Polaro) (CX26155P) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Sssnake (1983) (Gameworld) (133-003) (PAL).bin
████ 97%████ OK
Extracting /content/ROM/Stampede - Lasso-Helden (1981) (Activision, Bob Whi
tehead - Ariola) (EAG-011, PAG-011 - 711 011-715) (PAL).bin █████ 9
7%████ OK
Extracting /content/ROM/Star Raiders (Video Touch Pad) (1982) (Atari, Carla
Meninsky) (CX2660) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Strike (1988) (Telegames) (PAL).bin
████ 97%████ OK
Extracting /content/ROM/Star Trek - Strategic Operations Simulator (1983)
(SEGA, Jeff Lorenz - Teldec) (004-01 - 3.60103 VG) (PAL).bin █████ 9
7%████ OK
Extracting /content/ROM/Star Voyager (1982) (Imagic, Bob Smith) (720102-2B,
IA3201P, EIX-011-04I) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Wars - Jedi Arena (Paddle) (1983) (Parker Brot
hers, Rex Bradford) (931507) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Death Star Battle
(Revenge of the Jedi - Game II) (1983) (Parker Brothers - JWDA, Todd Marshal
l, Robin McDaniel, Ray Miller) (931513) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Wars - Return of the Jedi - Ewok Adventure (Re
venge of the Jedi - Game I) (1983) (Parker Brothers, Larry Gelberg) (PB5065)
(Prototype) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Wars - The Arcade Game (1984) (Parker Brother
s, Wilfredo Aguilar, Michael Becker, Neil McKenzie, Bob Smith, Brad Stewart)
(PB5540) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Star Wars - The Empire Strikes Back (1982) (Parker
Brothers, Rex Bradford, Sam Kjellman) (931501) (PAL).bin █████ 97%████
OK
Extracting /content/ROM/Stargate (1984) (Atari, Bill Aspromonte, Andrew Fuc
hs) (CX26120) (PAL).bin █████ 97%████ OK
Extracting /content/ROM/Stargunner (1983) (Telesys, Alex Leavens) (1005) (P
AL).bin █████ 97%████ OK
Extracting /content/ROM/StarMaster - Kommando Galaxis (1982) (Activision, A
lan Miller - Ariola) (EAX-016, PAX-016 - 711 016-725) (PAL) [fixed].bin
████ 97%████ OK
Extracting /content/ROM/StarMaster - Kommando Galaxis (1982) (Activision, A
lan Miller - Ariola) (EAX-016, PAX-016 - 711 016-725) (PAL).bin █████ 9
7%████ OK
Extracting /content/ROM/Strategy X (1983) (Gakken) (010) (PAL).bin
████ 97%████ OK

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Extracting /content/ROM/Strawberry Shortcake - Musical Match-Ups (1983) (Parker Brothers, Dawn Stockbridge) (PB5910) (PAL).bin 97% OK

Extracting /content/ROM/Street Racer (Wheels) (Paddle) (1977) (Atari, Larry Kaplan) (CX2612, CX2612P) (PAL).bin 97% OK

Extracting /content/ROM/Sub-Scan (Unknown) (PAL).bin 97% OK

Extracting /content/ROM/Subterranea (Tarantula) (1983) (Imagic, Mark Klein) (EIZ-003-04I) (PAL).bin 97% OK

Extracting /content/ROM/Suicide Mission (Meteoroids) (1982) (Starpath Corporation, Steve Hales, Stephen H. Landrum) (4) (AR-4102) (PAL).bin 97% OK

Extracting /content/ROM/Summer Games (1987) (Epyx, Steven A. Baker, Tod Frye, Peter Engelbrite) (80561-00250) (PAL).bin 98% OK

Extracting /content/ROM/Super Baseball (1988) (Atari, Mimi Nyden, Joseph Tung) (CX26152) (PAL).bin 98% OK

Extracting /content/ROM/Super Breakout (Paddle) (1982 - 1981) (Atari, Carol Shaw, Nick 'Sandy Maiwald' Turner) (CX2608) (PAL).bin 98% OK

Extracting /content/ROM/Super Cobra (1983) (Parker Brothers - Roklan, Paul Crowley, Bob Curtiss) (931505) (PAL).bin 98% OK

Extracting /content/ROM/Super Football (1988) (Atari, Douglas Neubauer) (CX26154, CX26154P) (PAL).bin 98% OK

Extracting /content/ROM/Super Kung-Fu (1983) (Xonox - K-Tel Software - VSS, Robert Weatherby) (6230, 6250) (PAL).bin 98% OK

Extracting /content/ROM/Supercharger BIOS (1982) (Arcadia Corporation) (PAL).bin 98% OK

Extracting /content/ROM/Superman (1979) (Atari, John Dunn) (CX2631, CX2631P) (PAL).bin 98% OK

Extracting /content/ROM/Surround (1977) (Blockade) (Atari, Alan Miller) (CX2641, CX2641P) (PAL).bin 98% OK

Extracting /content/ROM/Survival Island (Jungle Raid) (1983) (Starpath Corporation, Steve Mundry, Scott Nelson) (12) (AR-4401) (PAL).bin 98% OK

Extracting /content/ROM/Sword of Saros (1983) (Starpath Corporation, Stephen H. Landrum, Jon Leupp) (11) (AR-4201) (PAL).bin 98% OK

Extracting /content/ROM/SwordQuest - EarthWorld (Adventure I, SwordQuest I - EarthWorld) (1982) (Atari, Dan Hitchens, Mimi Nyden) (CX2656) (PAL).bin 98% OK

Extracting /content/ROM/SwordQuest - FireWorld (Adventure II, SwordQuest II - FireWorld) (1983) (Atari, Tod Frye, Mimi Nyden) (CX2657) (PAL).bin 98% OK

Extracting /content/ROM/Tac-Scan (Unknown) (PAL).bin 98% OK

Extracting /content/ROM/Tapeworm (1982) (Spectravision - Spectravideo) (SA-204) (PAL).bin 98% OK

Extracting /content/ROM/Taz (Tazz) (06-15-1983) (Atari, Jerome Domurat, Steve Woita) (CX2699) (Prototype) (PAL).bin 98% OK

Extracting /content/ROM/Tennis (1981) (Activision, Alan Miller - Ariola) (EAG-007, EAG-007-04I, PAG-007 - 711 007-720) (PAL).bin 98% OK

Extracting /content/ROM/Threshold (1982) (Tigervision, Warren Schwader - Teldec - Prism) (7-003 - 3.60003 VE) (PAL).bin 98% OK

Extracting /content/ROM/Time Pilot (Edu Games - Edu Juegos) (PAL).bin 98% OK

Extracting /content/ROM/Title Match Pro Wrestling - Pro Wrestling (1987) (Absolute Entertainment, Alex DeMeo) (EAZ-041-04I) (PAL).bin 98% OK

Extracting /content/ROM/Trick Shot (1982) (Imagic, Dennis Koble) (720100-2

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B, IA3000P) (PAL).bin      98%  OK
Extracting /content/ROM/Turmoil (Unknown) (PAL).bin
98%  OK
Extracting /content/ROM/Tutankham (1983) (Parker Brothers, Dave Engman, Daw
n Stockbridge) (931509) (PAL).bin      98%  OK
Extracting /content/ROM/UFO Patrol (AKA X'Mission) (1983) (Suntek) (SS-031)
(PAL).bin      98%  OK
Extracting /content/ROM/Universal Chaos (AKA Targ) (1988) (Telegames - VSS)
(7062 A305) (PAL).bin      98%  OK
Extracting /content/ROM/Vanguard (1983) (Atari - GCC, Dave Payne) (CX2669,
CX2669P) (PAL).bin      98%  OK
Extracting /content/ROM/Venture (1983) (CBS Electronics, Joseph Biel) (4L18
02, 4L1803, 4L1804, 4L2278) (PAL).bin      98%  OK
Extracting /content/ROM/Video Checkers - Atari Video Checkers (1980) (Atar
i, Carol Shaw) (CX2636, CX2636P) (PAL).bin      98%  OK
Extracting /content/ROM/Video Chess (Computer Chess) (1979) (Atari, Larry W
agner, Bob Whitehead) (CX2645, CX2645P) (PAL).bin      98%  OK
Extracting /content/ROM/Video Olympics (Paddle) (1977) (Atari, Joe Decuir)
(CX2621, CX2621P) (PAL).bin      98%  OK
Extracting /content/ROM/Video Pinball (1981) (Atari, Bob Smith) (CX2648) (P
AL).bin      98%  OK
Extracting /content/ROM/Warlords (Kings in the Corner) (Paddle) (1981) (Ata
ri, Carla Meninsky) (CX2610) (PAL).bin      98%  OK
Extracting /content/ROM/Warplock (Paddle) (1983) (Gameworld) (133-002) (PA
L).bin      98%  OK
Extracting /content/ROM/Wings (10-10-1983) (CBS Electronics, Stuart Ross)
(Prototype) (PAL).bin      98%  OK
Extracting /content/ROM/Winter Games (1987) (Epyx, Steven A. Baker, Tod Fry
e, Peter Engelbrite) (80561-00251) (PAL).bin      98%  OK
Extracting /content/ROM/Wizard of Wor (1982) (CBS Electronics - Roklan, Joe
Hellesen, Joe Wagner) (4L1720, 4L1721, 4L1722, 4L2276) (PAL).bin      9
8%  OK
Extracting /content/ROM/Word Zapper (Unknown) (PAL).bin
98%  OK
Extracting /content/ROM/Worm War I (Unknown) (PAL).bin
98%  OK
Extracting /content/ROM/X-Man (1983) (Universal Gamex Corporation, Miguel C
astillo, H.K. Poon) (GX-001) (PAL).bin      98%  OK
Extracting /content/ROM/Xenophobe (1991) (Atari) (CX26172) (PAL).bin
98%  OK
Extracting /content/ROM/Yars' Revenge (Time Freeze) (1982) (Atari, Howard S
cott Warshaw) (CX2655, CX2655P) (PAL).bin      98%  OK
Extracting /content/ROM/Zaxxon (1983) (CBS Electronics) (4L1784, 4L1786, 4L
1787, 4L2277) (PAL).bin      98%  OK
All OK
copying pong.bin from /content/ROM/Video Olympics - Pong Sports (Paddle) (19
77) (Atari, Joe Decuir - Sears) (CX2621 - 99806, 6-99806, 49-75104) ~.bin to
/usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/pong.bin
copying beam_rider.bin from /content/ROM/Beamrider (1984) (Activision - Ches
hire Engineering, David Rolfe, Larry Zwick) (AZ-037-04) ~.bin to /usr/local/
lib/python3.7/dist-packages/atari_py/atari_roms/beam_rider.bin
copying adventure.bin from /content/ROM/Adventure (PAL).bin to /usr/local/li
b/python3.7/dist-packages/atari_py/atari_roms/adventure.bin
copying kangaroo.bin from /content/ROM/Kangaroo.bin to /usr/local/lib/python
3.7/dist-packages/atari_py/atari_roms/kangaroo.bin
copying enduro.bin from /content/ROM/Enduro.bin to /usr/local/lib/python3.7/

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dist-packages/atari_py/atari_roms/enduro.bin
copying up_n_down.bin from /content/ROM/Up 'n Down.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/up_n_down.bin
copying wizard_of_wor.bin from /content/ROM/Wizard of Wor.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/wizard_of_wor.bin
copying ms_pacman.bin from /content/ROM/Ms. Pac-Man (1983) (Atari - GCC, Mark Ackerman, Glenn Parker) (CX2675) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/ms_pacman.bin
copying amidar.bin from /content/ROM/Amidar (1982) (Parker Brothers, Ed Temple) (PB5310) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/amidar.bin
copying robotank.bin from /content/ROM/Robot Tank (Robotank) (1983) (Activision, Alan Miller) (AZ-028, AG-028-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/robotank.bin
copying skiing.bin from /content/ROM/Skiing - Le Ski (1980) (Activision, Bob Whitehead) (AG-005, CAG-005, AG-005-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/skiing.bin
copying kung_fu_master.bin from /content/ROM/Kung-Fu Master (1987) (Activision - Imagineering, Dan Kitchen, Garry Kitchen) (AG-039-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/kung_fu_master.bin
copying donkey_kong.bin from /content/ROM/Donkey Kong (1987) (Atari) (CX26143).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/donkey_kong.bin
copying chopper_command.bin from /content/ROM/Chopper Command.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/chopper_command.bin
copying video_pinball.bin from /content/ROM/Video Pinball - Arcade Pinball.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/video_pinball.bin
copying sir_lancelot.bin from /content/ROM/Sir Lancelot (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/sir_lancelot.bin
copying seaquest.bin from /content/ROM/Seaquest (1983) (Activision, Steve Cartwright) (AX-022) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/seaquest.bin
copying galaxian.bin from /content/ROM/Galaxian.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/galaxian.bin
copying berzerk.bin from /content/ROM/Berzerk.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/berzerk.bin
copying demon_attack.bin from /content/ROM/Demon Attack.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/demon_attack.bin
copying bowling.bin from /content/ROM/Bowling (1979) (Atari, Larry Kaplan - Sears) (CX2628 - 6-99842, 49-75117) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/bowling.bin
copying journey_escape.bin from /content/ROM/Journey Escape.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/journey_escape.bin
copying kaboom.bin from /content/ROM/Kaboom!.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/kaboom.bin
copying asteroids.bin from /content/ROM/Asteroids [no copyright].bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/asteroids.bin
copying laser_gates.bin from /content/ROM/Laser Gates (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/laser_gates.bin
copying carnival.bin from /content/ROM/Carnival (1982) (Coleco - Woodside Design Associates, Steve 'Jessica Stevens' Kitchen) (2468) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/carnival.bin
copying road_runner.bin from patched version of /content/ROM/Road Runner (1989) (Atari - Bobco, Robert C. Polaro) (CX2663) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/road_runner.bin
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copying hero.bin from /content/ROM/H.E.R.O. (1984) (Activision, John Van Ryzin) (AZ-036-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/hero.bin

copying qbert.bin from /content/ROM/Q-bert (1987) (Atari) (CX26150).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/qbert.bin

copying trondead.bin from /content/ROM/TRON - Deadly Discs.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/trondead.bin

copying star_gunner.bin from /content/ROM/Stargunner.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/star_gunner.bin

copying keystone_kapers.bin from /content/ROM/Keystone Kapers (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/keystone_kapers.bin

copying jamesbond.bin from /content/ROM/James Bond 007 (James Bond Agent 007) (1984) (Parker Brothers - On-Time Software, Joe Gaucher, Dan Kurczewski, Louis Marbel, Kathy Von) (PB5110) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/jamesbond.bin

copying krull.bin from /content/ROM/Krull (1983) (Atari, Jerome Domurat, Dave Staugas) (CX2682) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/krull.bin

copying alien.bin from /content/ROM/Alien.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/alien.bin

copying frostbite.bin from /content/ROM/Frostbite.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/frostbite.bin

copying double_dunk.bin from /content/ROM/Double Dunk.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/double_dunk.bin

copying gopher.bin from /content/ROM/Gopher.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/gopher.bin

copying pooyan.bin from /content/ROM/Pooyan (1983) (Konami) (RC 100-X 02) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/pooyan.bin

copying frogger.bin from /content/ROM/Frogger.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/frogger.bin

copying boxing.bin from /content/ROM/Boxing.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/boxing.bin

copying tutankham.bin from /content/ROM/Tutankham (1983) (Parker Brothers, Dave Engman, Dawn Stockbridge) (PB5340) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/tutankham.bin

copying montezuma_revenge.bin from /content/ROM/Montezuma's Revenge - Featuring Panama Joe.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/montezuma_revenge.bin

copying phoenix.bin from /content/ROM/Phoenix (1983) (Atari - GCC, Mike Feinstein, John Mracek) (CX2673) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/phoenix.bin

copying surround.bin from /content/ROM/Surround - Chase (Blockade) (1977) (Atari, Alan Miller - Sears) (CX2641 - 99807, 49-75105) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/surround.bin

copying centipede.bin from /content/ROM/Centipede (1983) (Atari - GCC) (CX2676) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/centipede.bin

copying solaris.bin from /content/ROM/Solaris (The Last Starfighter, Star Raiders II, Universe) (1986) (Atari, Douglas Neubauer, Mimi Nyden) (CX26136) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/solaris.bin

copying yars_revenge.bin from /content/ROM/Yars' Revenge (Time Freeze) (1982) (Atari, Howard Scott Warshaw - Sears) (CX2655 - 49-75167) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/yars_revenge.bin

copying time_pilot.bin from /content/ROM/Time Pilot (1983) (Coleco - Woodsid

e Design Associates, Harley H. Puthuff Jr.) (2663) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/time_pilot.bin
copying pacman.bin from /content/ROM/Pac-Man (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/pacman.bin
copying assault.bin from /content/ROM/Assault (AKA Sky Alien) (1983) (Bomb - Onbase) (CA281).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/assault.bin
copying rивerraid.bin from /content/ROM/River Raid (1982) (Activision, Carol Shaw) (AX-020, AX-020-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/rивerraid.bin
copying name_this_game.bin from /content/ROM/Name This Game (Guardians of Treasure, Octopussy) (1983) (U.S. Games Corporation - JWDA, Roger Booth, Sylvia Day, Ron Dubren, Todd Marshall, Robin McDaniel, Wes Trager, Henry Will IV) (VC1007) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/name_this_game.bin
copying ice_hockey.bin from /content/ROM/Ice Hockey.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/ice_hockey.bin
copying king_kong.bin from /content/ROM/King Kong (1982) (Tigervision - Software Electronics Corporation, Karl T. Olinger - Teldec) (7-001 - 3.60001 VE) (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/king_kong.bin
copying fishing_derby.bin from /content/ROM/Fishing Derby.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/fishing_derby.bin
copying air_raid.bin from /content/ROM/Air Raid (Men-A-Vision) (PAL) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/air_raid.bin
copying breakout.bin from /content/ROM/Breakout - Breakaway IV (Paddle) (1978) (Atari, Brad Stewart - Sears) (CX2622 - 6-99813, 49-75107) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/breakout.bin
copying pitfall.bin from /content/ROM/Pitfall! - Pitfall Harry's Jungle Adventure (Jungle Runner) (1982) (Activision, David Crane) (AX-018, AX-018-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/pitfall.bin
copying bank_heist.bin from /content/ROM/Bank Heist (Bonnie & Clyde, Cops 'n' Robbers, Hold-Up, Roaring 20's) (1983) (20th Century Fox Video Games, Bill Aspromonte) (11012) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/bank_heist.bin
copying tennis.bin from /content/ROM/Tennis.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/tennis.bin
copying koolaid.bin from /content/ROM/Kool-Aid Man.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/koolaid.bin
copying lost_luggage.bin from /content/ROM/Lost Luggage [no opening scene].bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/lost_luggage.bin
copying crazy_climber.bin from /content/ROM/Crazy Climber (1983) (Atari - Roklan, Joe Gaucher, Alex Leavens) (CX2683) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/crazy_climber.bin
copying mr_do.bin from /content/ROM/Mr. Do! (1983) (CBS Electronics - Individeo, Ed English) (4L4478) (PAL).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/mr_do.bin
copying zaxxon.bin from /content/ROM/Zaxxon.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/zaxxon.bin
copying battle_zone.bin from /content/ROM/Battlezone (1983) (Atari - GCC, Mike Feinstein, Brad Rice) (CX2681) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/battle_zone.bin
copying freeway.bin from /content/ROM/Freeway.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/freeway.bin

```

copying private_eye.bin from /content/ROM/Private Eye (1984) (Activision, Bob Whitehead) (AG-034-04) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/private_eye.bin
copying gravitar.bin from /content/ROM/Gravitar (1983) (Atari, Dan Hitchens, Mimi Nyden) (CX2685) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/gravitar.bin
copying elevator_action.bin from /content/ROM/Elevator Action (Prototype).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/elevator_action.bin
copying defender.bin from /content/ROM/Defender (1982) (Atari, Robert C. Polaro, Alan J. Murphy - Sears) (CX2609 - 49-75186) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/defender.bin
copying venture.bin from /content/ROM/Venture.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/venture.bin
copying atlantis.bin from /content/ROM/Atlantis.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/atlantis.bin
copying space_invaders.bin from /content/ROM/Space Invaders (1980) (Atari, Richard Maurer - Sears) (CX2632 - 49-75153) ~.bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/space_invaders.bin
copying asterix.bin from /content/ROM/Asterix (AKA Taz) (1984) (Atari, Jerome Domurat, Steve Woita) (CX2696).bin to /usr/local/lib/python3.7/dist-packages/atari_py/atari_roms/asterix.bin

```

```

In [6]: #env_name = 'Breakout-v4'
env_name = 'Pong-v0'
#env_name = 'BreakoutDeterministic-v4'
#env = suite_gym.load(env_name)

# AtariPreprocessing runs 4 frames at a time, max-pooling over the last 2
# frames. We need to account for this when computing things like update
# intervals.
ATARI_FRAME_SKIP = 4

max_episode_frames=108000 # ALE frames

env = suite_atari.load(
    env_name,
    max_episode_steps=max_episode_frames / ATARI_FRAME_SKIP,
    gym_env_wrappers=suite_atari.DEFAULT_ATARI_GYM_WRAPPERS_WITH_STACKING)
#env = batched_py_environment.BatchedPyEnvironment([env])

```

```

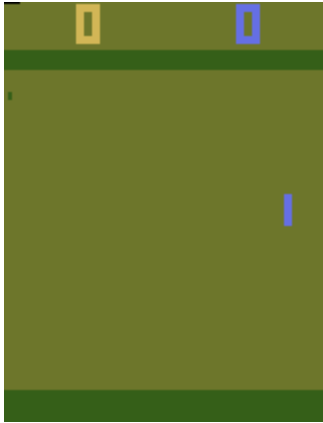
/usr/local/lib/python3.7/dist-packages/ale_py/roms/__init__.py:94: DeprecationWarning: Automatic importing of atari-py roms won't be supported in future releases of ale-py. Please migrate over to using `ale-import-roms` OR an ALE-supported ROM package. To make this warning disappear you can run `ale-import-roms --import-from-pkg atari_py.atari_roms`. For more information see: https://github.com/mgbellemare/Arcade-Learning-Environment#rom-management
    _RESOLVED_ROMS = _resolve_roms()
/usr/local/lib/python3.7/dist-packages/gym/logger.py:30: UserWarning: WARN: obs_type "image" should be replaced with the image type, one of: rgb, grayscale
    warnings.warn(colorize('%s: %s'%( 'WARN', msg % args), 'yellow'))

```

We can now reset the environment and display one step. The following image shows how the Pong game environment appears to a user.

```
In [7]: env.reset()
        PIL.Image.fromarray(env.render())
```

Out[7]:



We are now ready to load and wrap the two environments for TF-Agents. The algorithm uses the first environment for evaluation and the second to train.

```
In [8]: train_py_env = suite_atari.load(
        env_name,
        max_episode_steps=max_episode_frames / ATARI_FRAME_SKIP,
        gym_env_wrappers=suite_atari.DEFAULT_ATARI_GYM_WRAPPERS_WITH_STACKING)

        eval_py_env = suite_atari.load(
        env_name,
        max_episode_steps=max_episode_frames / ATARI_FRAME_SKIP,
        gym_env_wrappers=suite_atari.DEFAULT_ATARI_GYM_WRAPPERS_WITH_STACKING)

        train_env = tf_py_environment.TFPyEnvironment(train_py_env)
        eval_env = tf_py_environment.TFPyEnvironment(eval_py_env)
```

```
/usr/local/lib/python3.7/dist-packages/gym/logger.py:30: UserWarning: WARN:
obs_type "image" should be replaced with the image type, one of: rgb, graysc
ale
warnings.warn(colorize('%s: %s'%( 'WARN', msg % args), 'yellow'))
```

Agent

I used the following code from the TF-Agents examples to wrap up the regular Q-network class. The AtariQNetwork class ensures that the pixel values from the Atari screen are divided by 255. This division assists the neural network by normalizing the pixel values between 0 and 1.

```
In [9]: # AtariPreprocessing runs 4 frames at a time, max-pooling over the last 2
        # frames. We need to account for this when computing things like update
        # intervals.
        ATARI_FRAME_SKIP = 4

        class AtariCategoricalQNetwork(network.Network):
            """CategoricalQNetwork subclass that divides observations by 255."""
```

```

def __init__(self, input_tensor_spec, action_spec, **kwargs):
    super(AtariCategoricalQNetwork, self).__init__(
        input_tensor_spec, state_spec=())
    input_tensor_spec = tf.TensorSpec(
        dtype=tf.float32, shape=input_tensor_spec.shape)
    self._categorical_q_network = \
        categorical_q_network.CategoricalQNetwork(
            input_tensor_spec, action_spec, **kwargs)

@property
def num_atoms(self):
    return self._categorical_q_network.num_atoms

def call(self, observation, step_type=None, network_state=()):
    state = tf.cast(observation, tf.float32)
    # We divide the grayscale pixel values by 255 here rather than
    # storing normalized values beause uint8s are 4x cheaper to
    # store than float32s.
    # TODO(b/129805821): handle the division by 255 for
    # train_eval_atari.py in
    # a preprocessing layer instead.
    state = state / 255
    return self._categorical_q_network(
        state, step_type=step_type, network_state=network_state)

```

Next, we introduce two hyperparameters specific to the neural network we are about to define.

```

In [10]: fc_layer_params = (512,)
conv_layer_params = ((32, (8, 8), 4), (64, (4, 4), 2), (64, (3, 3), 1))

q_net = AtariCategoricalQNetwork(
    train_env.observation_spec(),
    train_env.action_spec(),
    conv_layer_params=conv_layer_params,
    fc_layer_params=fc_layer_params)

```

Convolutional neural networks usually comprise several alternating pairs of convolution and max-pooling layers, ultimately culminating in one or more dense layers. These layers are the same types as previously seen in this course. The **QNetwork** accepts two parameters that define the convolutional neural network structure.

The more simple of the two parameters is **fc_layer_params**. This parameter specifies the size of each of the dense layers. A tuple specifies the size of each of the layers in a list.

The second parameter, named **conv_layer_params**, is a list of convolution layers parameters, where each item is a length-three tuple indicating (filters, kernel_size, stride). This implementation of QNetwork supports only convolution layers. If you

desire a more complex convolutional neural network, you must define your variant of the **QNetwork**.

The **QNetwork** defined here is not the agent. Instead, the **QNetwork** is used by the DQN agent to implement the actual neural network. This technique allows flexibility as you can set your class if needed.

Next, we define the optimizer. For this example, I used RMSPropOptimizer. However, AdamOptimizer is another popular choice. We also created the DQN agent and referenced the Q-network.

```
In [11]: optimizer = tf.compat.v1.train.RMSPropOptimizer(
    learning_rate=learning_rate,
    decay=0.95,
    momentum=0.0,
    epsilon=0.00001,
    centered=True)

train_step_counter = tf.Variable(0)

observation_spec = tensor_spec.from_spec(train_env.observation_spec())
time_step_spec = ts.time_step_spec(observation_spec)

action_spec = tensor_spec.from_spec(train_env.action_spec())
target_update_period = 32000 # ALE frames
update_period = 16 # ALE frames
_update_period = update_period / ATARI_FRAME_SKIP

agent = categorical_dqn_agent.CategoricalDqnAgent(
    time_step_spec,
    action_spec,
    categorical_q_network=q_net,
    optimizer=optimizer,
    # epsilon_greedy=epsilon,
    n_step_update=1.0,
    target_update_tau=1.0,
    target_update_period=(
        target_update_period / ATARI_FRAME_SKIP / _update_period),
    gamma=0.99,
    reward_scale_factor=1.0,
    gradient_clipping=None,
    debug_summaries=False,
    summarize_grads_and_vars=False)

agent.initialize()
```

Metrics and Evaluation

There are many different ways to measure the effectiveness of a model trained with reinforcement learning. The loss function of the internal Q-network is not a good

measure of the entire DQN algorithm's overall fitness. The network loss function measures how close the Q-network fits the collected data and does not indicate how effectively the DQN maximizes rewards. The method used for this example tracks the average reward received over several episodes.

```
In [16]: def compute_avg_return(environment, policy, num_episodes=10):

    total_return = 0.0
    for _ in range(num_episodes):

        time_step = environment.reset()
        episode_return = 0.0

        while not time_step.is_last():
            action_step = policy.action(time_step)
            time_step = environment.step(action_step.action)
            episode_return += time_step.reward
            total_return += episode_return

    avg_return = total_return / num_episodes
    return avg_return.numpy()[0]

# See also the metrics module for standard implementations of
# different metrics.
# https://github.com/tensorflow/agents/tree/master/tf_agents/metrics
```

Replay Buffer

DQN works by training a neural network to predict the Q-values for every possible environment state. A neural network needs training data, so the algorithm accumulates this training data as it runs episodes. The replay buffer is where this data is stored. Only the most recent episodes are stored; older episode data rolls off the queue as the queue accumulates new data.

```
In [17]: replay_buffer = tf_uniform_replay_buffer.TFUniformReplayBuffer(
    data_spec=agent.collect_data_spec,
    batch_size=train_env.batch_size,
    max_length=replay_buffer_max_length)

# Dataset generates trajectories with shape [Bx2x...]
dataset = replay_buffer.as_dataset(
    num_parallel_calls=3,
    sample_batch_size=batch_size,
    num_steps=2).prefetch(3)
```


WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/autograph/impl/api.py:377: ReplayBuffer.get_next (from tf_agents.replay_buffers.replay_buffer) is deprecated and will be removed in a future version.

Instructions for updating:

Use ``as_dataset(..., single_deterministic_pass=False)`` instead.

Random Collection

The algorithm must prime the pump. Training cannot begin on an empty replay buffer. The following code performs a predefined number of steps to generate initial training data.

```
In [18]: random_policy = random_tf_policy.RandomTFPolicy(train_env.time_step_spec(),
                                                         train_env.action_spec())

def collect_step(environment, policy, buffer):
    time_step = environment.current_time_step()
    action_step = policy.action(time_step)
    next_time_step = environment.step(action_step.action)
    traj = trajectory.from_transition(time_step, action_step, \
                                     next_time_step)

    # Add trajectory to the replay buffer
    buffer.add_batch(traj)

def collect_data(env, policy, buffer, steps):
    for _ in range(steps):
        collect_step(env, policy, buffer)

collect_data(train_env, random_policy, replay_buffer,
             steps=initial_collect_steps)
```

Training the Agent

We are now ready to train the DQN. Depending on how many episodes you wish to run through, this process can take many hours. This code will update both the loss and average return as training occurs. As training becomes more successful, the average return should increase. The losses reported reflecting the average loss for individual training batches.

```
In [19]: iterator = iter(dataset)

# (Optional) Optimize by wrapping some of the code in a graph
# using TF function.
agent.train = common.function(agent.train)
```

```

# Reset the train step
agent.train_step_counter.assign(0)

# Evaluate the agent's policy once before training.
avg_return = compute_avg_return(eval_env, agent.policy,
                                num_eval_episodes)

returns = [avg_return]

for _ in range(num_iterations):

    # Collect a few steps using collect_policy and
    # save to the replay buffer.
    for _ in range(collect_steps_per_iteration):
        collect_step(train_env, agent.collect_policy, replay_buffer)

    # Sample a batch of data from the buffer and
    # update the agent's network.
    experience, unused_info = next(iterator)
    train_loss = agent.train(experience).loss

    step = agent.train_step_counter.numpy()

    if step % log_interval == 0:
        print('step = {0}: loss = {1}'.format(step, train_loss))

    if step % eval_interval == 0:
        avg_return = compute_avg_return(eval_env, agent.policy,
                                        num_eval_episodes)
        print('step = {0}: Average Return = {1}'.format(step, avg_return))
        returns.append(avg_return)

```

```

step = 1000: loss = 3.9279017448425293
step = 2000: loss = 3.9280214309692383
step = 3000: loss = 3.924931526184082
step = 4000: loss = 3.9209065437316895
step = 5000: loss = 3.919551134109497
step = 6000: loss = 3.919588327407837
step = 7000: loss = 3.9074008464813232
step = 8000: loss = 3.8954014778137207
step = 9000: loss = 3.8865578174591064
step = 10000: loss = 3.895845890045166

```

Videos

Perhaps the most compelling way to view an Atari game's results is a video that allows us to see the agent play the game. We now have a trained model and observed its training progress on a graph. The following functions are defined to watch the agent play the game in the notebook.

```

In [21]: def embed_mp4(filename):
        """Embeds an mp4 file in the notebook."""
        video = open(filename, 'rb').read()
        b64 = base64.b64encode(video)
        tag = '''

```

```

<video width="640" height="480" controls>
  <source src="data:video/mp4;base64,{0}" type="video/mp4">
  Your browser does not support the video tag.
</video>''.format(b64.decode())

    return IPython.display.HTML(tag)

def create_policy_eval_video(policy, filename, num_episodes=5, fps=30):
    filename = filename + ".mp4"
    with imageio.get_writer(filename, fps=fps) as video:
        for _ in range(num_episodes):
            time_step = eval_env.reset()
            video.append_data(eval_py_env.render())
            while not time_step.is_last():
                action_step = policy.action(time_step)
                time_step = eval_env.step(action_step.action)
                video.append_data(eval_py_env.render())
    return embed_mp4(filename)

```

First, we will observe the trained agent play the game.

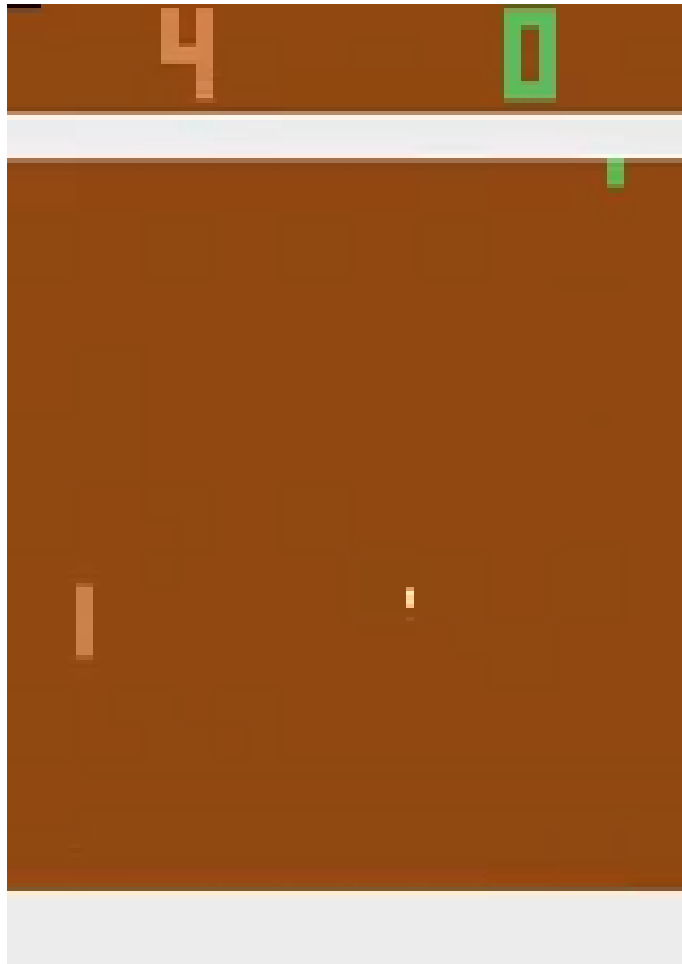
```

In [22]: # HIDE OUTPUT
         create_policy_eval_video(agent.policy, "trained-agent")

```

WARNING:root:IMAGEIO FFMPEG_WRITER WARNING: input image is not divisible by macro_block_size=16, resizing from (210, 160) to (224, 160) to ensure video compatibility with most codecs and players. To prevent resizing, make your input image divisible by the macro_block_size or set the macro_block_size to None (risking incompatibility). You may also see a FFMPEG warning concerning speedloss due to data not being aligned.

Out[22]:



For comparison, we observe a random agent play. While the trained agent is far from perfect, with enough training, it does outperform the random agent considerably.

```
In [24]: # HIDE OUTPUT  
create_policy_eval_video(random_policy, "random-agent")
```

WARNING:root:IMAGEIO FFMPEG_WRITER WARNING: input image is not divisible by macro_block_size=16, resizing from (210, 160) to (224, 160) to ensure video compatibility with most codecs and players. To prevent resizing, make your input image divisible by the macro_block_size or set the macro_block_size to None (risking incompatibility). You may also see a FFMPEG warning concerning speedloss due to data not being aligned.

Out[24]:





T81-558: Applications of Deep Neural Networks

Module 12: Reinforcement Learning

- Instructor: [Jeff Heaton](#), McKelvey School of Engineering, [Washington University in St. Louis](#)
- For more information visit the [class website](#).

Module 12 Video Material

- Part 12.1: Introduction to the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
- Part 12.2: Introduction to Q-Learning [\[Video\]](#) [\[Notebook\]](#)
- Part 12.3: Keras Q-Learning in the OpenAI Gym [\[Video\]](#) [\[Notebook\]](#)
- Part 12.4: Atari Games with Keras Neural Networks [\[Video\]](#) [\[Notebook\]](#)
- **Part 12.5: Application of Reinforcement Learning** [\[Video\]](#) [\[Notebook\]](#)

Google CoLab Instructions

The following code ensures that Google CoLab is running the correct version of TensorFlow.

```
In [1]: try:
        from google.colab import drive
        %tensorflow_version 2.x
        COLAB = True
        print("Note: using Google CoLab")
    except:
        print("Note: not using Google CoLab")
        COLAB = False
```

Note: using Google CoLab

```
In [2]: # HIDE OUTPUT
        if COLAB:
            !sudo apt-get install - y xvfb ffmpeg x11-utils
            !pip install - q 'gym==0.17.3'
            !pip install - q 'imageio==2.4.0'
            !pip install - q PILLOW
            !pip install - q 'pyglet==1.3.2'
```

```
!pip install -q pyvirtualdisplay  
!pip install -q 'tf-agents==0.12.0'
```

```

Reading package lists... Done
Building dependency tree
Reading state information... Done
ffmpeg is already the newest version (7:3.4.8-0ubuntu0.2).
Suggested packages:
  mesa-utils
The following NEW packages will be installed:
  libxxf86dga1 x11-utils xvfb
0 upgraded, 3 newly installed, 0 to remove and 39 not upgraded.
Need to get 993 kB of archives.
After this operation, 2,982 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu bionic/main amd64 libxxf86dga1 amd64
2:1.1.4-1 [13.7 kB]
Get:2 http://archive.ubuntu.com/ubuntu bionic/main amd64 x11-utils amd64 7.7
+3build1 [196 kB]
Get:3 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 xvfb am
d64 2:1.19.6-1ubuntu4.10 [784 kB]
Fetched 993 kB in 0s (3,848 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based fr
ontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 7
6, <=> line 3.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package libxxf86dga1:amd64.
(Reading database ... 156210 files and directories currently installed.)
Preparing to unpack .../libxxf86dga1_2%3a1.1.4-1_amd64.deb ...
Unpacking libxxf86dga1:amd64 (2:1.1.4-1) ...
Selecting previously unselected package x11-utils.
Preparing to unpack .../x11-utils_7.7+3build1_amd64.deb ...
Unpacking x11-utils (7.7+3build1) ...
Selecting previously unselected package xvfb.
Preparing to unpack .../xvfb_2%3a1.19.6-1ubuntu4.10_amd64.deb ...
Unpacking xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up xvfb (2:1.19.6-1ubuntu4.10) ...
Setting up libxxf86dga1:amd64 (2:1.1.4-1) ...
Setting up x11-utils (7.7+3build1) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1.3) ...
/sbin/ldconfig.real: /usr/local/lib/python3.7/dist-packages/ideep4py/lib/lib
mkldnn.so.0 is not a symbolic link

```

```

|████████████████████████████████████████| 3.3 MB 5.1 MB/s
Building wheel for imageio (setup.py) ... done
ERROR: pip's dependency resolver does not currently take into account all th
e packages that are installed. This behaviour is the source of the following
dependency conflicts.
albumations 0.1.12 requires imgaug<0.2.7,>=0.2.5, but you have imgaug 0.
2.9 which is incompatible.
|████████████████████████████████████████| 1.0 MB 5.0 MB/s
ERROR: pip's dependency resolver does not currently take into account all th
e packages that are installed. This behaviour is the source of the following
dependency conflicts.

```


gym 0.17.3 requires pygame<=1.5.0,>=1.4.0, but you have pygame 1.3.2 which is incompatible.

			1.3 MB	5.0 MB/s
			1.0 MB	83.9 MB/s

Part 12.5: Application of Reinforcement Learning

Creating an environment is the first step to applying TF-Agent-based reinforcement learning to a problem with your design. This part will see how to create your environment and apply it to an agent that allows actions to be floating-point values rather than the discrete actions employed by the Deep Q-Networks (DQN) that we used earlier in this chapter. This new type of agent is called a Deep Deterministic Policy Gradients (DDPG) network. From an application standpoint, the primary difference between DDPG and DQN is that DQN only supports discrete actions, whereas DDPG supports continuous actions; however, there are other essential differences that we will cover later in this chapter.

The environment that I will demonstrate in this chapter simulates paying off a mortgage and saving for retirement. This simulation allows the agent to allocate their income between several types of accounts, buying luxury items, and paying off their mortgage. The goal is to maximize net worth. Because we wish to provide the agent with the ability to distribute their income among several accounts, we provide continuous (floating point) actions that determine this distribution of the agent's salary.

Similar to previous TF-Agent examples in this chapter, we begin by importing needed packages.

```
In [3]: import base64
import imageio
import IPython
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import PIL.Image
import pyvirtualdisplay
import math
import numpy as np

import tensorflow as tf

from tf_agents.agents.ddpg import actor_network
from tf_agents.agents.ddpg import critic_network
from tf_agents.agents.ddpg import ddpq_agent

from tf_agents.agents.dqn import dqn_agent
from tf_agents.drivers import dynamic_step_driver
```

```

from tf_agents.environments import suite_gym
from tf_agents.environments import tf_py_environment
from tf_agents.eval import metric_utils
from tf_agents.metrics import tf_metrics
from tf_agents.networks import q_network
from tf_agents.policies import random_tf_policy
from tf_agents.replay_buffers import tf_uniform_replay_buffer
from tf_agents.trajectories import trajectory
from tf_agents.trajectories import policy_step
from tf_agents.utils import common

import gym
from gym import spaces
from gym.utils import seeding
from gym.envs.registration import register
import PIL.ImageDraw
import PIL.Image
from PIL import ImageFont

```

If you get the following error, restart and rerun the Google CoLab environment. Sometimes a restart is needed after installing TF-Agents.

```

AttributeError: module 'google.protobuf.descriptor' has no
attribute '_internal_create_key'

```

We create a virtual display to view the simulation in a Jupyter notebook.

```

In [4]: # Set up a virtual display for rendering OpenAI gym environments.
vdisplay = pyvirtualdisplay.Display(visible=0, size=(1400, 900)).start()

```

Create an Environment of your Own

An environment is a simulator that your agent runs in. An environment must have a current state. Some of this state is visible to the agent. However, the environment also hides some aspects of the state from the agent. Likewise, the agent takes actions that will affect the state of the environment. There may also be internal actions outside the agent's control. For example, in the finance simulator demonstrated in this section, the agent does not control the investment returns or rate of inflation. Instead, the agent must react to these external actions and state components.

The environment class that you create must contain these elements:

- Be a child class of **gym.Env**
- Implement a **seed** function that sets a seed that governs the simulation's random aspects. For this environment, the seed oversees the random fluctuations in inflation and rates of return.
- Implement a **reset** function that resets the state for a new episode.
- Implement a **render** function that renders one frame of the simulation. The rendering is only for display and does not affect reinforcement learning.

- Implement a **step** function that performs one step of your simulation.

The class presented below implements a financial planning simulation. The agent must save for retirement and should attempt to amass the greatest possible net worth. The simulation includes the following key elements:

- Random starting salary between 40K (USD) and 60K (USD).
- Home loan for a house with a random purchase price between 1.5 and 4 times the starting salary.
- Home loan is a standard amortized 30-year loan with a fixed monthly payment.
- Paying higher than the home's monthly payment pays the loan down quicker. Paying below the monthly payment results in late fees and eventually foreclosure.
- Ability to allocate income between luxury purchases and home payments (above or below payment amount) and a taxable and tax-advantaged savings account.

The state is composed of the following floating-point values:

- **age** - The agent's current age in months (steps)
- **salary** - The agent's starting salary, increases relative to inflation.
- **home_value** - The value of the agent's home, increases relative to inflation.
- **home_loan** - How much the agent still owes on their home.
- **req_home_pmt** - The minimum required home payment.
- **acct_tax_adv** - The balance of the tax advantaged retirement account.
- **acct_tax** - The balance of the taxable retirement account.

The action space is composed of the following floating-point values (between 0 and 1):

- **home_loan** - The amount to apply to a home loan.
- **savings_tax_adv** - The amount to deposit in a tax-advantaged savings account.
- **savings_taxable** - The amount to deposit in a taxable savings account.
- **luxury** - The amount to spend on luxury items/services.

The actions are weights that the program converts to a percentage of the total. For example, the home loan percentage is the home loan action value divided by all actions (including a home loan). The following code implements the environment and provides implementation details in the comments.

```
In [5]: class SimpleGameOfLifeEnv(gym.Env):
    metadata = {
        'render.modes': ['human', 'rgb_array'],
        'video.frames_per_second': 1
    }

    STATE_ELEMENTS = 7
    STATES = ['age', 'salary', 'home_value', 'home_loan', 'req_home_pmt',
              'acct_tax_adv', 'acct_tax', "expenses", "actual_home_pmt",
              "tax_deposit",
              "tax_adv_deposit", "net_worth"]
```

```

STATE_AGE = 0
STATE_SALARY = 1
STATE_HOME_VALUE = 2
STATE_HOME_LOAN = 3
STATE_HOME_REQ_PAYMENT = 4
STATE_SAVE_TAX_ADV = 5
STATE_SAVE_TAXABLE = 6

MEG = 1.0e6

ACTION_ELEMENTS = 4
ACTION_HOME_LOAN = 0
ACTION_SAVE_TAX_ADV = 1
ACTION_SAVE_TAXABLE = 2
ACTION_LUXURY = 3

INFLATION = (0.015)/12.0
INTEREST = (0.05)/12.0
TAX_RATE = (.142)/12.0
EXPENSES = 0.6
INVEST_RETURN = 0.065/12.0
SALARY_LOW = 40000.0
SALARY_HIGH = 60000.0
START_AGE = 18
RETIRE_AGE = 80

def __init__(self, goal_velocity=0):
    self.verbose = False
    self.viewer = None

    self.action_space = spaces.Box(
        low=0.0,
        high=1.0,
        shape=(SimpleGameOfLifeEnv.ACTION_ELEMENTS,),
        dtype=np.float32
    )
    self.observation_space = spaces.Box(
        low=0,
        high=2,
        shape=(SimpleGameOfLifeEnv.STATE_ELEMENTS,),
        dtype=np.float32
    )

    self.seed()
    self.reset()

    self.state_log = []

def seed(self, seed=None):
    self.np_random, seed = seeding.np_random(seed)
    return [seed]

def _calc_net_worth(self):
    home_value = self.state[
        SimpleGameOfLifeEnv.STATE_HOME_VALUE]
    principal = self.state[

```

```

        SimpleGameOfLifeEnv.STATE_HOME_LOAN]
    worth = home_value - principal
    worth += self.state[
        SimpleGameOfLifeEnv.STATE_SAVE_TAX_ADV]
    worth += self.state[
        SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE]
    return worth

def _eval_action(self, action, payment):
    # Calculate actions
    act_home_payment = action[
        SimpleGameOfLifeEnv.ACTION_HOME_LOAN]
    act_tax_adv_pay = action[
        SimpleGameOfLifeEnv.ACTION_SAVE_TAX_ADV]
    act_taxable = action[
        SimpleGameOfLifeEnv.ACTION_SAVE_TAXABLE]
    act_luxury = action[
        SimpleGameOfLifeEnv.ACTION_LUXURY]
    if payment <= 0:
        act_home_payment = 0
    total_act = act_home_payment + act_tax_adv_pay \
        + act_taxable + \
        act_luxury + self.expenses

    if total_act < 1e-2:
        pct_home_payment = 0
        pct_tax_adv_pay = 0
        pct_taxable = 0
        pct_luxury = 0
    else:
        pct_home_payment = act_home_payment / total_act
        pct_tax_adv_pay = act_tax_adv_pay / total_act
        pct_taxable = act_taxable / total_act
        pct_luxury = act_luxury / total_act

    return pct_home_payment, pct_tax_adv_pay, pct_taxable, pct_luxury

def step(self, action):
    self.last_action = action
    age = self.state[SimpleGameOfLifeEnv.STATE_AGE]
    salary = self.state[SimpleGameOfLifeEnv.STATE_SALARY]
    home_value = self.state[SimpleGameOfLifeEnv.STATE_HOME_VALUE]
    principal = self.state[SimpleGameOfLifeEnv.STATE_HOME_LOAN]
    payment = self.state[SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT]
    net1 = self._calc_net_worth()
    remaining_salary = salary

    # Calculate actions
    pct_home_payment, pct_tax_adv_pay, pct_taxable, pct_luxury = \
        self._eval_action(action, payment)

    # Expenses
    current_expenses = salary * self.expenses
    remaining_salary -= current_expenses
    if self.verbose:
        print(f"Expenses: {current_expenses}")

```

```

        print(f"Remaining Salary: {remaining_salary}")

    # Tax advantaged deposit action
    my_tax_adv_deposit = min(salary * pct_tax_adv_pay,
                             remaining_salary)

    # Govt CAP
    my_tax_adv_deposit = min(my_tax_adv_deposit,
                             self.year_tax_adv_deposit_left)
    self.year_tax_adv_deposit_left -= my_tax_adv_deposit
    remaining_salary -= my_tax_adv_deposit

    # Company match
    tax_adv_deposit = my_tax_adv_deposit * 1.05
    self.state[SimpleGameOfLifeEnv.STATE_SAVE_TAX_ADV] += \
        int(tax_adv_deposit)

    if self.verbose:
        print(f"IRA Deposit: {tax_adv_deposit}")
        print(f"Remaining Salary: {remaining_salary}")

    # Tax
    remaining_salary -= remaining_salary * \
        SimpleGameOfLifeEnv.TAX_RATE
    if self.verbose:
        print(f"Tax Salary: {remaining_salary}")

    # Home payment
    actual_payment = min(salary * pct_home_payment,
                         remaining_salary)

    if principal > 0:
        ipart = principal * SimpleGameOfLifeEnv.INTEREST
        ppart = actual_payment - ipart
        principal = int(principal-ppart)
        if principal <= 0:
            principal = 0
            self.state[SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT] = 0
        elif actual_payment < payment:
            self.late_count += 1
            if self.late_count > 15:
                sell = (home_value-principal)/2
                sell -= 20000
                sell = max(sell, 0)
                self.state[SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE] \
                    += sell
                principal = 0
                home_value = 0
                self.expenses += .3
                self.state[SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT] \
                    = 0
                if self.verbose:
                    print(f"Foreclosure!!")
            else:
                late_fee = payment * 0.1
                principal += late_fee
                if self.verbose:
                    print(f"Late Fee: {late_fee}")

```

```

        self.state[SimpleGameOfLifeEnv.STATE_HOME_LOAN] = principal
        remaining_salary -= actual_payment

    if self.verbose:
        print(f"Home Payment: {actual_payment}")
        print(f"Remaining Salary: {remaining_salary}")

    # Taxable savings
    actual_savings = remaining_salary * pct_taxable
    self.state[SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE] \
        += actual_savings
    remaining_salary -= actual_savings

    if self.verbose:
        print(f"Tax Save: {actual_savings}")
        print(f"Remaining Salary (goes to Luxury): {remaining_salary}")

    # Investment income
    return_taxable = self.state[
        SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE] \
        * self.invest_return
    return_tax_adv = self.state[
        SimpleGameOfLifeEnv.STATE_SAVE_TAX_ADV] \
        * self.invest_return

    return_taxable *= 1 - SimpleGameOfLifeEnv.TAX_RATE
    self.state[SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE] \
        += return_taxable
    self.state[SimpleGameOfLifeEnv.STATE_SAVE_TAX_ADV] \
        += return_tax_adv

    # Yearly events
    if age > 0 and age % 12 == 0:
        self.perform_yearly()

    # Monthly events
    self.state[SimpleGameOfLifeEnv.STATE_AGE] += 1

    # Time to retire (by age?)
    done = self.state[SimpleGameOfLifeEnv.STATE_AGE] > \
        (SimpleGameOfLifeEnv.RETIRE_AGE*12)

    # Calculate reward
    net2 = self._calc_net_worth()
    reward = net2 - net1

    # Track progress
    if self.verbose:
        print(f"Networth: {nw}")
        print(f"*** End Step {self.step_num}: State={self.state}, \
            Reward={reward}")
    self.state_log.append(self.state + [current_expenses,
                                        actual_payment,
                                        actual_savings,
                                        my_tax_adv_deposit,

```

```

net2])

self.step_num += 1

# Normalize state and finish up
norm_state = [x/SimpleGameOfLifeEnv.MEG for x in self.state]
return norm_state, reward/SimpleGameOfLifeEnv.MEG, done, {}

def perform_yearly(self):
    salary = self.state[SimpleGameOfLifeEnv.STATE_SALARY]
    home_value = self.state[SimpleGameOfLifeEnv.STATE_HOME_VALUE]

    self.inflation = SimpleGameOfLifeEnv.INTEREST + \
        self.np_random.normal(loc=0, scale=1e-2)
    self.invest_return = SimpleGameOfLifeEnv.INVEST_RETURN + \
        self.np_random.normal(loc=0, scale=1e-2)

    self.year_tax_adv_deposit_left = 19000
    self.state[SimpleGameOfLifeEnv.STATE_SALARY] = \
        int(salary * (1+self.inflation))

    self.state[SimpleGameOfLifeEnv.STATE_HOME_VALUE] \
        = int(home_value * (1+self.inflation))

def reset(self):
    self.expenses = SimpleGameOfLifeEnv.EXPENSES
    self.late_count = 0
    self.step_num = 0
    self.last_action = [0] * SimpleGameOfLifeEnv.ACTION_ELEMENTS
    self.state = [0] * SimpleGameOfLifeEnv.STATE_ELEMENTS
    self.state_log = []
    salary = float(self.np_random.randint(
        low=SimpleGameOfLifeEnv.SALARY_LOW,
        high=SimpleGameOfLifeEnv.SALARY_HIGH))
    house_mult = self.np_random.uniform(low=1.5, high=4)
    value = round(salary*house_mult)
    p = (value*0.9)
    i = SimpleGameOfLifeEnv.INTEREST
    n = 30 * 12
    m = float(int(p * (i * (1 + i)**n) / ((1 + i)**n - 1)))
    self.state[SimpleGameOfLifeEnv.STATE_AGE] = \
        SimpleGameOfLifeEnv.START_AGE * 12
    self.state[SimpleGameOfLifeEnv.STATE_SALARY] = salary / 12.0
    self.state[SimpleGameOfLifeEnv.STATE_HOME_VALUE] = value
    self.state[SimpleGameOfLifeEnv.STATE_HOME_LOAN] = p
    self.state[SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT] = m
    self.year_tax_adv_deposit_left = 19000
    self.perform_yearly()
    return np.array(self.state)

def render(self, mode='human'):
    screen_width = 600
    screen_height = 400

    img = PIL.Image.new('RGB', (600, 400))
    d = PIL.ImageDraw.Draw(img)
    font = ImageFont.load_default()

```



```

y = 0
_, height = d.textsize("W", font)

age = self.state[SimpleGameOfLifeEnv.STATE_AGE]
salary = self.state[SimpleGameOfLifeEnv.STATE_SALARY]*12
home_value = self.state[
    SimpleGameOfLifeEnv.STATE_HOME_VALUE]
home_loan = self.state[
    SimpleGameOfLifeEnv.STATE_HOME_LOAN]
home_payment = self.state[
    SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT]
balance_tax_adv = self.state[
    SimpleGameOfLifeEnv.STATE_SAVE_TAX_ADV]
balance_taxable = self.state[
    SimpleGameOfLifeEnv.STATE_SAVE_TAXABLE]
net_worth = self._calc_net_worth()

d.text((0, y), f"Age: {age/12}", fill=(0, 255, 0))
y += height
d.text((0, y), f"Salary: {salary:,.}", fill=(0, 255, 0))
y += height
d.text((0, y), f"Home Value: {home_value:,.}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Home Loan: {home_loan:,.}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Home Payment: {home_payment:,.}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Balance Tax Adv: {balance_tax_adv:,.}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Balance Taxable: {balance_taxable:,.}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Net Worth: {net_worth:,.}", fill=(0, 255, 0))
y += height*2

payment = self.state[SimpleGameOfLifeEnv.STATE_HOME_REQ_PAYMENT]
pct_home_payment, pct_tax_adv_pay, pct_taxable, pct_luxury = \
    self._eval_action(self.last_action, payment)
d.text((0, y), f"Percent Home Payment: {pct_home_payment}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Percent Tax Adv: {pct_tax_adv_pay}",
       fill=(0, 255, 0))
y += height
d.text((0, y), f"Percent Taxable: {pct_taxable}", fill=(0, 255, 0))
y += height
d.text((0, y), f"Percent Luxury: {pct_luxury}", fill=(0, 255, 0))

return np.array(img)

def close(self):
    pass

```

You must register the environment class with TF-Agents before your program can use it.

```
In [6]: register(
        id='simple-game-of-life-v0',
        entry_point=f'__name__:SimpleGameOfLifeEnv',
    )
```

Testing the Environment

This financial planning environment is complex. It took me some degree of testing to perfect it. Even at the current state of this simulator, it is far from a complete financial simulator. The primary objective of this simulator is to demonstrate creating your environment for a non-video game project.

I used the following code to help test this simulator. I ran the simulator with fixed actions and then loaded the state into a Pandas data frame for easy viewing.

```
In [7]: env_name = 'simple-game-of-life-v0'
env = gym.make(env_name)

env.reset()
done = False

i = 0
env.verbose = False
while not done:
    i += 1
    state, reward, done, _ = env.step([1, 1, 0, 0])
    env.render()

env.close()
```

```
In [8]: import pandas as pd

df = pd.DataFrame(env.state_log, columns=SimpleGameOfLifeEnv.STATES)
df = df.round(0)
df['age'] = df['age']/12
df['age'] = df['age'].round(2)
for col in df.columns:
    df[col] = df[col].apply(lambda x: "{:,}".format(x))

pd.set_option('display.max_columns', 7)
pd.set_option('display.max_rows', 12)
display(df)
```

	age	salary	home_value	...	tax_deposit	tax_adv_deposit	net_worth
0	18.08	4,876	214,749	...	0.0	1,880.0	24,578.0
1	18.17	4,876	214,749	...	0.0	1,875.0	25,791.0
2	18.25	4,876	214,749	...	0.0	1,875.0	27,039.0
3	18.33	4,876	214,749	...	0.0	1,875.0	28,321.0
4	18.42	4,876	214,749	...	0.0	1,875.0	29,640.0
...
740	79.75	6,830	302,304	...	0.0	683.0	3,990,102.0
741	79.83	6,830	302,304	...	0.0	683.0	3,989,629.0
742	79.92	6,830	302,304	...	0.0	683.0	3,989,157.0
743	80.0	6,830	302,304	...	0.0	683.0	3,988,684.0
744	80.08	6,816	301,724	...	0.0	683.0	3,987,632.0

745 rows × 12 columns

1810888.5833333335

Hyperparameters

I tuned the following hyperparameters to get a reasonable result from training the agent. Further optimization would be beneficial.

```
In [9]: # How long should training run?
num_iterations = 3000
# How often should the program provide an update.
log_interval = 500

# How many initial random steps, before training start, to
# collect initial data.
initial_collect_steps = 1000
# How many steps should we run each iteration to collect
# data from.
collect_steps_per_iteration = 50
# How much data should we store for training examples.
replay_buffer_max_length = 100000

batch_size = 64

# How many episodes should the program use for each evaluation.
num_eval_episodes = 100
# How often should an evaluation occur.
eval_interval = 5000
```

Instantiate the Environment

We are now ready to make use of our environment. Because we registered the environment with TF-Agents the program can load the environment by its name "simple-game-of-life-v".

```
In [10]: env_name = 'simple-game-of-life-v0'
#env_name = 'MountainCarContinuous-v0'
env = suite_gym.load(env_name)
```

We can now have a quick look at the first state rendered. Here we can see the random salary and home values are chosen for an agent. The learned policy must be able to consider different starting salaries and home values and find an appropriate strategy.

```
In [11]: env.reset()
PIL.Image.fromarray(env.render())
```

```
Out[11]: Age: 18.0
Salary: 40,212
Home Value: 118,793
Home Loan: 106,682.40000000001
Home Payment: 572.0
Balance Tax Adv: 0
Balance Taxable: 0
Net Worth: 12,110.599999999991

Percent Home Payment: 0.0
Percent Tax Adv: 0.0
Percent Taxable: 0.0
Percent Luxury: 0.0
```

Just as before, the program instantiates two environments: one for training and one for evaluation.

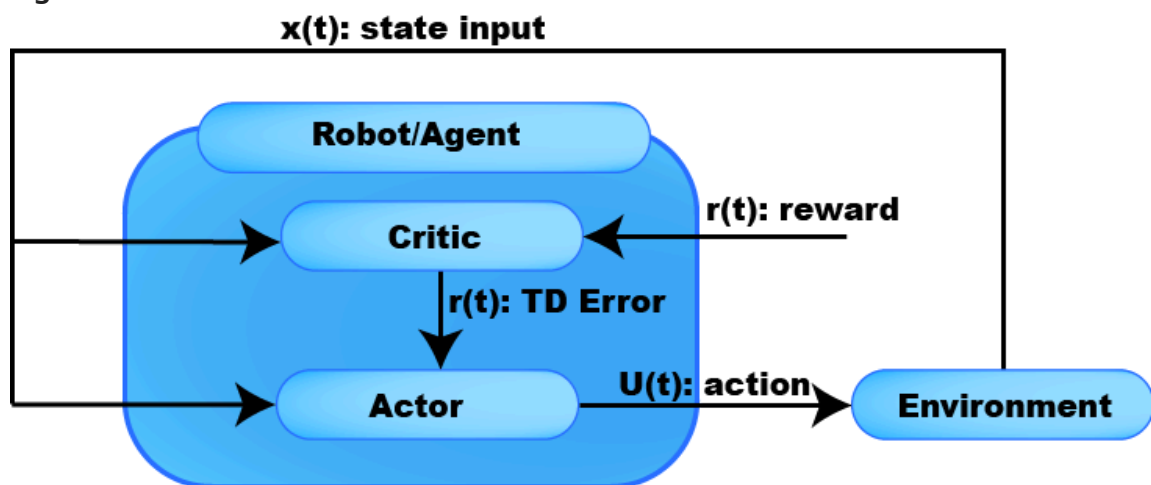
```
In [12]: train_py_env = suite_gym.load(env_name)
eval_py_env = suite_gym.load(env_name)

train_env = tf_py_environment.TFPyEnvironment(train_py_env)
eval_env = tf_py_environment.TFPyEnvironment(eval_py_env)
```

You might be wondering why a DQN does not support continuous actions. This limitation is that the DQN algorithm maps each action as an output neuron. Each of these neurons predicts the likely future reward for taking each action. The algorithm knows the future rewards for each particular action. Generally, the DQN agent will perform the action that has the highest reward. However, because a continuous number represented in a computer has an effectively infinite number of possible values, it is not possible to calculate a future reward estimate for all of them.

We will use the Deep Deterministic Policy Gradients (DDPG) algorithm to provide a continuous action space. [Cite:lillicrap2015continuous] This technique uses two neural networks. The first neural network, called an actor, acts as the agent and predicts the expected reward for a given value of the action. The second neural network, called a critic, is trained to predict the accuracy of the actor-network. Training two neural networks in parallel that operate adversarially is a popular technique. Earlier in this course, we saw that Generative Adversarial Networks (GAN) used a similar method. Figure 12.DDPG shows the structure of the DDPG network that we will use.

Figure 12.DDPG: Actor Critic Model



The environment provides the same input ($x(t)$) for each time step to both the actor and critic networks. The temporal difference error ($r(t)$) reports the difference between the estimated reward and the actual reward at any given state or time step.

The following code creates the actor and critic neural networks.

```

In [13]: actor_fc_layers = (400, 300)
critic_obs_fc_layers = (400,)
critic_action_fc_layers = None
critic_joint_fc_layers = (300,)
ou_stddev = 0.2
ou_damping = 0.15
target_update_tau = 0.05
target_update_period = 5
dqda_clipping = None
td_errors_loss_fn = tf.compat.v1.losses.huber_loss
  
```

```
gamma = 0.995
reward_scale_factor = 1.0
gradient_clipping = None

actor_learning_rate = 1e-4
critic_learning_rate = 1e-3
debug_summaries = False
summarize_grads_and_vars = False

global_step = tf.compat.v1.train.get_or_create_global_step()

actor_net = actor_network.ActorNetwork(
    train_env.time_step_spec().observation,
    train_env.action_spec(),
    fc_layer_params=actor_fc_layers,
)

critic_net_input_specs = (train_env.time_step_spec().observation,
                          train_env.action_spec())

critic_net = critic_network.CriticNetwork(
    critic_net_input_specs,
    observation_fc_layer_params=critic_obs_fc_layers,
    action_fc_layer_params=critic_action_fc_layers,
    joint_fc_layer_params=critic_joint_fc_layers,
)

tf_agent = ddpq_agent.DdpqAgent(
    train_env.time_step_spec(),
    train_env.action_spec(),
    actor_network=actor_net,
    critic_network=critic_net,
    actor_optimizer=tf.compat.v1.train.AdamOptimizer(
        learning_rate=actor_learning_rate),
    critic_optimizer=tf.compat.v1.train.AdamOptimizer(
        learning_rate=critic_learning_rate),
    ou_stddev=ou_stddev,
    ou_damping=ou_damping,
    target_update_tau=target_update_tau,
    target_update_period=target_update_period,
    dqda_clipping=dqda_clipping,
    td_errors_loss_fn=td_errors_loss_fn,
    gamma=gamma,
    reward_scale_factor=reward_scale_factor,
    gradient_clipping=gradient_clipping,
    debug_summaries=debug_summaries,
    summarize_grads_and_vars=summarize_grads_and_vars,
    train_step_counter=global_step)
tf_agent.initialize()
```

Metrics and Evaluation

Just as in previous examples, we will compute the average return over several episodes to evaluate performance.

```
In [14]: def compute_avg_return(environment, policy, num_episodes=10):

    total_return = 0.0
    for _ in range(num_episodes):

        time_step = environment.reset()
        episode_return = 0.0

        while not time_step.is_last():
            action_step = policy.action(time_step)
            time_step = environment.step(action_step.action)
            episode_return += time_step.reward
            total_return += episode_return

    avg_return = total_return / num_episodes
    return avg_return.numpy()[0]

# See also the metrics module for standard implementations of
# different metrics.
# https://github.com/tensorflow/agents/tree/master/tf_agents/metrics
```

Data Collection

Now execute the random policy in the environment for a few steps, recording the data in the replay buffer.

```
In [15]: def collect_step(environment, policy, buffer):
    time_step = environment.current_time_step()
    action_step = policy.action(time_step)
    next_time_step = \
        environment.step(action_step.action)
    traj = trajectory.from_transition(\
        time_step, action_step,\
        next_time_step)

    # Add trajectory to the replay buffer
    buffer.add_batch(traj)

def collect_data(env, policy, buffer, steps):
    for _ in range(steps):
        collect_step(env, policy, buffer)

random_policy = random_tf_policy.RandomTFPolicy(\
```

```

train_env.time_step_spec(),\
train_env.action_spec())

replay_buffer = tf_uniform_replay_buffer.TFUniformReplayBuffer(
    data_spec=tf_agent.collect_data_spec,
    batch_size=train_env.batch_size,
    max_length=replay_buffer_max_length)

collect_data(train_env, random_policy, replay_buffer, steps=100)

# Dataset generates trajectories with shape [Bx2x...]
dataset = replay_buffer.as_dataset(
    num_parallel_calls=3,
    sample_batch_size=batch_size,
    num_steps=2).prefetch(3)

```

WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/autograph/impl/api.py:377: ReplayBuffer.get_next (from tf_agents.replay_buffers.replay_buffer) is deprecated and will be removed in a future version.

Instructions for updating:

Use ``as_dataset(..., single_deterministic_pass=False)`` instead.

Training the agent

We are now ready to train the agent. Depending on how many episodes you wish to run through, this process can take many hours. This code will update on both the loss and average return as training occurs. As training becomes more successful, the average return should increase. The losses reported reflect the average loss for individual training batches.

```

In [16]: iterator = iter(dataset)

# (Optional) Optimize by wrapping some of the code in a graph using
# TF function.
tf_agent.train = common.function(tf_agent.train)

# Reset the train step
tf_agent.train_step_counter.assign(0)

# Evaluate the agent's policy once before training.
avg_return = compute_avg_return(eval_env, tf_agent.policy,
                                num_eval_episodes)

returns = [avg_return]

for _ in range(num_iterations):

    # Collect a few steps using collect_policy and
    # save to the replay buffer.
    for _ in range(collect_steps_per_iteration):
        collect_step(train_env, tf_agent.collect_policy, replay_buffer)

    # Sample a batch of data from the buffer and update the

```



```
# agent's network.
experience, unused_info = next(iterator)
train_loss = tf_agent.train(experience).loss

step = tf_agent.train_step_counter.numpy()

if step % log_interval == 0:
    print('step = {0}: loss = {1}'.format(step, train_loss))

if step % eval_interval == 0:
    avg_return = compute_avg_return(eval_env, tf_agent.policy,
                                    num_eval_episodes)
    print('step = {0}: Average Return = {1}'.format(step, avg_return))
    returns.append(avg_return)
```

```
step = 500: loss = 0.00016351199883501977
step = 1000: loss = 6.34381067357026e-05
step = 1500: loss = 0.0012666243128478527
step = 2000: loss = 0.00041321030585095286
step = 2500: loss = 0.0006321941618807614
step = 3000: loss = 0.0006611005519516766
```

Visualization

The notebook can plot the average return over training iterations. The average return should increase as the program performs more training iterations.

Videos

We use the following functions to produce video in Jupyter notebook. As the person moves through their career, they focus on paying off the house and tax advantage investing.

```
In [18]: # HIDE OUTPUT
def embed_mp4(filename):
    """Embeds an mp4 file in the notebook."""
    video = open(filename, 'rb').read()
    b64 = base64.b64encode(video)
    tag = '''
<video width="640" height="480" controls>
  <source src="data:video/mp4;base64,{0}" type="video/mp4">
  Your browser does not support the video tag.
</video>'''
    return IPython.display.HTML(tag)

def create_policy_eval_video(policy, filename, num_episodes=5, fps=30):
    filename = filename + ".mp4"
    with imageio.get_writer(filename, fps=fps) as video:
        for _ in range(num_episodes):
            time_step = eval_env.reset()
            video.append_data(eval_py_env.render())
```

```
while not time_step.is_last():  
    action_step = policy.action(time_step)  
    time_step = eval_env.step(action_step.action)  
    video.append_data(eval_py_env.render())  
return embed_mp4(filename)
```

```
create_policy_eval_video(tf_agent.policy, "trained-agent")
```

WARNING:root:IMAGEIO FFMPEG_WRITER WARNING: input image is not divisible by macro_block_size=16, resizing from (400, 600) to (400, 608) to ensure video compatibility with most codecs and players. To prevent resizing, make your input image divisible by the macro_block_size or set the macro_block_size to None (risking incompatibility). You may also see a FFMPEG warning concerning speedloss due to data not being aligned.

Out[18]:

```
Age: 65.83333333333333  
Salary: 69,276  
Home Value: 129,170  
Home Loan: 0  
Home Payment: 0  
Balance Tax Adv: 2,163,499.471473834  
Balance Taxable: 12,322765378272667  
Net Worth: 2,292,681.7942392123  
  
Percent Home Payment: 0.0  
Percent Tax Adv: 0.5263157894736842  
Percent Taxable: 0.0  
Percent Luxury: 0.0
```