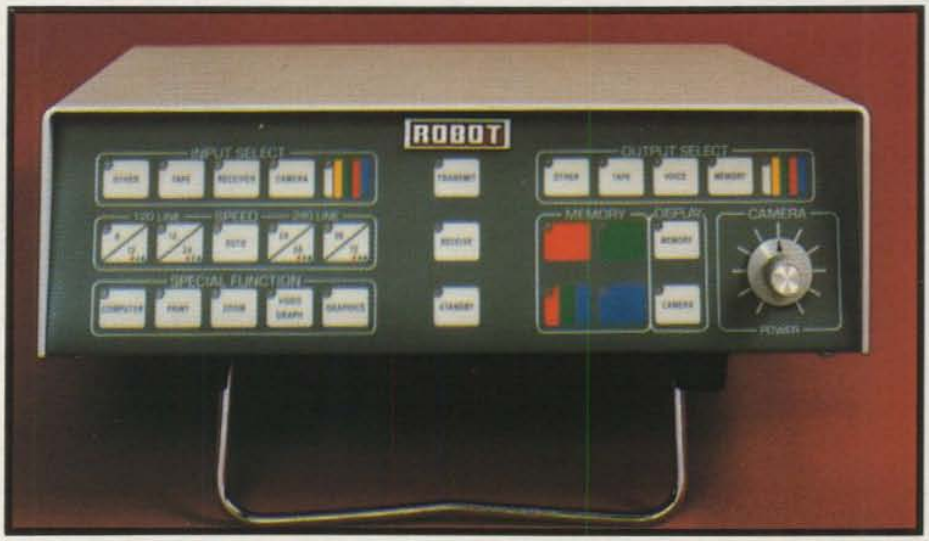
CQ REVIEWS:

The Robot Research Inc. Model 1200C Color Slow Scan Converter

BY WILLIAM H. DEWITT*, W2DD

In the days when we ran a regular SSTV column, Bill DeWitt, W2DD, was its editor for several years. Bill was one of the original devotees of SSTV and that slow moving green picture. Recently, Bill's interest in SSTV rekindled and he, like you, has a whole new world of high-tech gear at his disposal. —K2EEK



Front view of the Robot Research 1200C color scan converter.

Slow scan television is a still picture transmission system invented by an amateur named Copthorne MacDonald about 30 years ago. On a worldwide basis there are probably about 30,000 amateurs using SSTV at present. By gentlemen's agreement SSTV is used principally on 3845, 7171, 14230, 21340, and 28680 kHz, but a whole range of frequencies can be used in accordance with license classification.

Slow scan television has come a long way since its invention by (the then college senior) Copthorne MacDonald. In MacDonald's system, image brightness information is converted into audio tones ranging from 1500 Hz (black) to 2300 Hz (white) to create a 128-line picture in 8 seconds. This brightness to audio tone relationship is still universally used. An SSTV signal has a characteristically strong warbling sound as you tune across it.

In the early life of SSTV, pictures were displayed on a long-persistence screen CRT. There was a disturbing disappearance of the top part of the picture as

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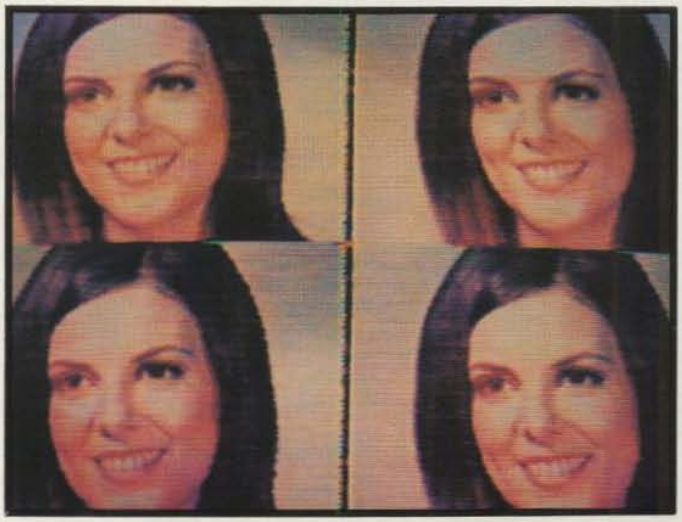
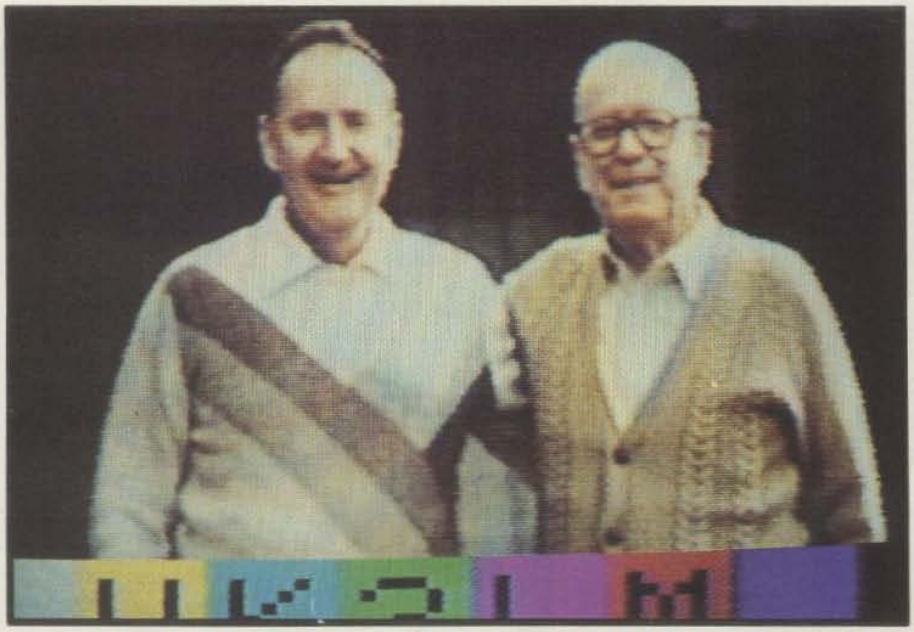
By combining pages 1 and 2, one 240-line full-color picture can be stored.



Another variation easily accomplished is "quad" operation, where up to four reduced-size pictures can be displayed.



VK3LM, John, left with VK4ZG, George, or Brisbane.

the 8 second scan ended at the bottom. However, the system did work and it provided the basis for continuing effort to improve it.

SSTV In The Digital Age

With the advent of digitized data handling and IC storage systems the just-mentioned transient nature of SSTV pictures was eliminated, and over a period of time a number of color SSTV systems came into use. The Robot Research Inc. Model 1200C Color Scan Converter introduced a few years ago now dominates color SSTV operation in the U.S.A. and a large part of the rest of the world. Without a doubt it has also been a prime factor in the rebirth of interest in SSTV. More SSTV stations are coming on the air every week and intercontinental exchanges of color pictures have become a non-event!

Against this background, now seems like a good time to have a look at the picture quality and operating features of the Robot Model 1200C.

First Things First

The Model 1200C I tested was well packaged and arrived in perfect condition with basic cables and instruction manual. It's a compact, low-profile piece of gear only 11.25″ W × 4.0″ H × 12.5″ D. Power consumption is an underwhelming 10 watts.

The notebook-form instruction manual supplied is excellent. It gives specific operating instructions and tells how to make a demonstration tape that helps the user get started with the 1200C. It also includes a wealth of information regarding computer controlled operation, hard copy printout, the use of an RGB monitor, necessary diagrams, and sample programs in Basic. My congratulations to Robot for producing a manual that can be understood by someone other than the inventor!

Now let's get down to the nitty-gritty and review the features of this little gray box that helps amateurs send pictures all over the world.

A General Description

The Robot Model 1200C is a microprocessor-based high-resolution color video scan converter and image processor. Its design technology is based on an 8031 microprocessor system including 16K bytes of ROM and 2K bytes of RAM. Image display is supported by 1,105,920 bits of RAM. High-quality full-color images can be transmitted or received over any voice-grade communications link in as few as **12** seconds per frame. Since brightness and color data are multiplexed in transmission, images appear in full color as they are created on the monitor screen.

When combined with a suitable host computer, the 1200C will support sophisticated image processing as well as error-free digital image storage. Pictures can be held in memory for continued viewing and/or stored for future use on an ordinary cassette tape.

Many modifications have been devised and applied to the 1200C. This review deals only with the Model 1200C Color Scan Converter as sold by Robot Research Inc.

Some Comments On Picture Quality

If you have any memories of "old-time SSTV," throw them away! *Under good conditions overall picture quality approaches that of U.S. broadcast television.* For a given receiving condition, picture quality varies in accordance with frame time. Color reproduction is excellent.

A Few Comments About The 1200C Controls

The 1200C uses state-of-the-art concepts in control-panel design. Twenty-seven light touch switches with LED indicators are used to control all functions except camera brightness and AC input. The light touch switches are physically grouped

Treasury Building and Town Hall, Perth, Western Australia.

according to function. A logical layout of the Memory, Speed, Display, and other controls makes it easy for the operator to choose or change functions quickly. Red LEDs let you know what functions are enabled.

Principal Features and How They're Used

1. Five signal inputs are possible on the 1200C. They include: standard color bars, received SSTV audio, taped SSTV, frame grabbed camera SSTV, and "other" for a source of your choice. Similar outputs are available for transmission.

2. Compatibility with other systems. The 1200C can send and receive 8 second B/W pictures, and its 12 second color pictures can be received as B/W on scan converters having that frame speed. These built-in features make the 1200C compatible with the thousands of stations still operating in solely the B/W mode.

As delivered, the 1200C is not compatible with a line-sequential system widely used in Europe.

3. Color and B/W Camera Capable. Almost any color camera will work with the 1200C. You can also make a composite color picture using a black-and-white camera with color filters to sequentially record (and then combine) red, green, and blue filtered images of still subjects.

4. Multiple Speeds. Four frame speeds (each) are provided for color and B/W operation. This feature lets you choose the speed that works best with the prevailing conditions.

5. A Two-Page Memory. There are six independent image memories, three to a page. These memories may be loaded, transmitted, or processed in any order desired. They can be combined to transmit or receive medium- or high-resolution full-color images.

Two 120-line pictures can be stored at the same time (one on each page).

Combining pages 1 and 2, one 240-line full-color picture can be stored; see fig. 1. Combining pages 1 and 2 also permits "QUAD" operation in which up to four (reduced size) pictures (the same or all different) can be displayed in the four quadrants of the monitor screen; see fig. 2. A dream of the sixties comes true!

6. Transmit Cursor. A full screen width cursor indicates the image line being transmitted. This is a very useful feature when transmitting pictures or taping a series of pictures.

7. A total of 262,144 possible Color Combinations. Eighteen bits of digital information define each picture element, making available a practically unlimited palette of colors. The color reproduction is truly excellent.

8. Color Bars. Standardized color bars can be enabled for set up and testing or for direct transmission. Great for adjusting your color monitor.

9. Fully Automatic Receive Operation. At the user's option the 1200C will perform all SSTV receive functions automatically when receiving color SSTV signals originating with another 1200C. This is high-tech at work.

10. Automatic Fine Tuning. ROBOT developed software detects mistuning over a 300 Hz range and compensates automatically, assuring accurate color reproduction. This feature is especially helpful to a distinguished few operators who consistently miss-tune SSB voices.

11. Computer Interface. When interfaced with a suitable host computer, the 1200C becomes a sophisticated image processor limited only by the controlling software. Great graphics from W5ZR and N6GEA demonstrate this daily.

12. Printer Interface. The 1200C can easily be interfaced with any Epson Series 80 printer with graphics capability to produce black-and-white hardcopy output. A Transtar 315 Color graphics printer is necessary for color reproduction.

13. Model 1200C units operating on 60 cycle current are configured for NTSC composite color video; 50 cycle for PAL composite color video.

With its price tag of $1295.00, the 1200C is not an inexpensive piece of equipment. It's also a piece of equipment with a state-of-the-art design that permits creative use of the unit by itself or in combination with computers and other graphics sources. It has a reputation for good, stable operation.

If you enjoy the excitement and pleasure of viewing good-quality pictures of faraway amateurs, their homes, families, cars, places of interest, and countless other subjects, then this gear is well worth the price.

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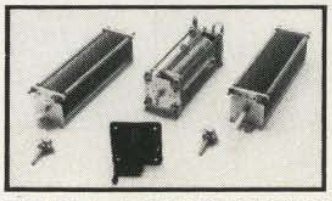

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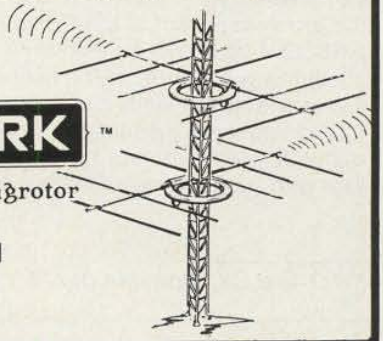

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