ORANGE COUNTY AMATEUR RADIO CLUB
P. O. BOX 95
ORANGE CA. 92669

FIRST CLASS

DATED MATERIAL: Volume XIII Number VII JULY 1972

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ORANGE COUNTY AMATEUR RADIO CLUB
P.O. Box 95, Orange, Ca. 92669

Volume XIII No. VII
Meeting July 21, 1972

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1972 Club Officers

Pres:	Ron Cade - WA6FIT	897-8059
V. Pres:	Bob Eckweiler - WB6QNU	639-5074
Sec:	Richard Nelson - WA6OBM	557-6614
Treas:	Frank O'Leary - WB6TBU	539-1769
Activity:	Kiyoshi Yamachita - W6NGO	538-8942
T.V.I:	Bill Robinson - WB6WOO	542-7958
Mem:	Ernest Duebendorfer - WB6VOV	539-6469
Pub. Rel.:	Lee Farnsworth - WB6FKD	542-4846
M.A.L.:	Bill Hall - WB6CQR	638-0101
	Ken Konechy - W6HHC	541-6249
R.F. Ed.:	Richard Nelson - WA6OBM	557-6614

* *

OCA RC ACTIVITIES

MEETING 3rd Friday each month, 7:30 p.m.

BREAKFAST 1st Saturday each month, 8:30 am at Mannys Restaurant, 17th Street near Newport Freeway, Santa Ana. Meets in back of room.

15 M NET Club Station W6ZE, meets every Thursday at 21.375 (± QRM) MHz. at 8:00 p.m. All amateurs welcome to check in. Club and ARRL Bulletins read.

May Board Meeting Minutes

The May Board Meeting was held at the residence of Richard Nelson, WA60BM on May 15, 1972. President, Ron Cade, WA6FIT, called the meeting to order at 8:20 p.m. The following officers were not present: Vice President, Bob Eckweiler, WB6QNU; Activity Chairman, Kiyoshi Yamachita, W6NGO; T.V.I. Chairman, Bill Robinson, WB6WOO, and Member at Large, WB6CQR.

The Treasurer's Report was: Cash $24.91; Savings $1,067.39; Checking $156.51, for a Total of $1,248.81.

Field Day 1972 to be held June 24 & 25th was discussed. Topics covered were tents, generator, team captains for various bands, site, meals, and sanitation facilities. No final decisions were made, and an outline of possible solutions prepared for discussion at the membership meeting.

Submitted by Ric
Secretary
Richard Nelson

On The Screen

Duck You Sucker

Sergio Leone is the Italian director who skyrocketed Clint Eastwood to fame in Italian meatballs like "For A Few Dollars More."

You can take our word -- "Duck, You Sucker" will do nothing for stars Rod Steiger and James Coburn.

The two, a Mexican bandito and an Irish freedom-fighter, respectively, ride across Italy during the Mexican Revolution to the strains of an unbelieveably ludicrous theme song.

With nary a plot or hint of suspense, only the performances of the duo keep us riding along for nearly three hours.

ELECTRONIC BUYERS NEWS JULY 10'72

JUNE MEMBERSHIP MEETING MINUTES

The June membership meeting was held at the Republic Savings and Loan building on June 16, 1972. President Ron Cade, WA6FIT, called the meeting to order at 8:10 PM, Abscent officer was Treasurer, Frank O'Leary, WB6TBU due to a back injury. May minutes are to be corrected to read: Abscent officer was Activity Chairmen, Kiyoshi Yamachita, W6NGO. Late officers were Vice President, Bob Eckweiler, WB6QNU, and T.V.I. Chairman Bill Robinson, WB6WOO. Also 20 meter Captain should be Ken Konechy, W6HHC.

Ken Konechy, W6HHC, reported that $88 had been collected to date from the sale of Christmas raffle tickets. Ron Cade, WA6FIT will see that the sign at Henry Radio giving our old Lincoln Savings and Loan meeting place is removed/changed. Bob Eckweiler, WB6QNU, announced that Douglas may have a trailer and tower availble through salvage in the near future.

After much heated discussion among the members and Board concerning a prior purchase af a Triasto Mini Mast model MM35, Bob Eckweiler, WB6QNU made a motion seconded by Ken Konechy, W6HHC, that the club purchase the mast to be used during field day. Voting of the members passed the motion 9 to 7 in favor of making the purchase.

A motion was made by Bill Hall, WB6CQR, duly seconded, that the president establish a commette to up-date the clubs by-laws. The motion passed and president Ron Cade appointed Dave Hollander, W6COJ as Chairman.

Bill Hall made a motion, seconded by Dave Hollander to give authority to President , Ron Cade, to find a perminate meeting place with authority to agree to pay a nominal cleaning fee if required. The motion passed.

LeRoy Sparks, W6SYC, protested the manner in which the meeting was carried on, and complained in general about past meetings. He suggested that: 1. That there be a program every meeting. 2. That the program follows the business meeting and 20 minute break. 3. That the business meeting be limited to about 20 minutes.

Break for coffee and donuts at 9:20 PM. Resume at 9:35.

Field day planning occupied the remainder of the meeting. until 10:05 adjournment. Bill Hall, WB6CQR, will coordinate food for Field day. Jack Shaw, WA6YWN, will see that publicity will be given the field day activity.

Submitted by Ric,
Richard J. Nelson
Secretary

# #

PREZ SEZ

Our 1972 field day was a very sucessful affair. Most transmitters were operated during band openings and the number of contacts increased over last year. Everybody pitched in and all stations operated without serious problems. Bill Hall did an exceptional job at handling the food and I believe that no one went hungry. Some of our members didn't make it to the site, but the vast majority of you at least paid us a visit. I want to personally thank all of you who participated to keep the OCARC growing in ability and skill.

Ron, WA6FIT

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BITS AND PIECES

XV5AC is authorized to work U.S. Amateurs according to ARRL Bul. 378. This is the first station in Vietnam that U.S. Amateurs can legaly communicate with.

JA VISITOR Kei, W6NGO, is host to visiting Ryo, JA1DOD. Many OCARC members have worked Ryo from Japan.

THIRD PARTY TRAFFIC Phone Patches and othe third party traffic is legal only with the following prefixes: CE, CM, CO, CP, CX, EL, HC, HH, HL, HK, HP, HR, LU, OA, PY, TI, VE, VO, W or K/8P, XE, XP, YN, YS, YV, ZP, 4X, 4Z, and 9Y4.

PICNIC There will be a picnic with all Orange County Clubs invited. Place: Pearson Park, Anaheim on Harbor a few blocks north of Lincoln. Bring your own basket (food). Drinks (coffee and soda) on the house. Bring all your family and friends and eye ball those ops you bumped into on the air during Field Day.

SCM LEAVING Jerru Verduff, W6MNY, is moving to New Mexico. As of August 1, 1972 Bill Weise, W6CPB, will act as SCM for the Orange Section. A Dutch lunchon will be given for Jerry at Sir Georges at 550 N. Tustin in Orange on July 22 at 12:30. Drop in and say good bye to Jerry.

SEC RESIGNING Bill Hall can no longer handle the duties of our SEC. Steve Philips, WA6TVA, will act as SEC. Bill has to give his full time to OTHER activities??

HP-35A Problem of the month. Solve for a, if $a = e^{i\pi} + 1$. Hint: $e^{i\pi} = \cos\pi + i\sin\pi$ (see back of inside cover for answer)

NEW GENERAL WB6PEW, is EX WN6PEW. Congratlations. Now we have to get some novices because we now have zero novices.

FOR SALE 54' crank up tower with CDR rotator, Mosely TA 33 Sr. and 8 el. 6M ant. $200.00 buys the lot. Must sell by September 1 due to move back to Texas. Call Thomas Johnson, WB6LZV at (213) 596-3655 at home, or (213) 426-7341 at his office.

FIELD DAY CONTACTS

The following unofficial approximate contact count for sideband operation only for the Orange county clubs is listed for information only.

BAND	OCARC	FULLERTON	NARS
75	50	358	204
40	350	454	335
20	530	601	459
15	521	652	432
2	94	0	99

These scores are in some cases raw counts and in others are reduced counts, but give an approximate comparison of how each club did. Anaheim field day chairman could not provide any data.

For comparison of past years with this years performance the Phone contacts are listed for the five years from 1968 thru 1972.

BAND	1968	1969	1970	1971	1972
75	224	98	272	274	50
40	396	50	0	106	350
20	328	375	531	530	521
15	430	301	426	136	530
2	145	169	0	0	94
Totals	1523	993	1229	1046	1545

The totals are not an accurate comparison because CW contacts are not included. Also 1970 scores are only the top three bands. There are two observations worth noting. 1. Consistant number of contacts 1970 thru 1972 for 20 meters? 2. Improved 40 meter contacts for 1972.

Field Day is an activity that can be as much fun as the participants wish or it can be a true contest in which no effort is spared to try to come out on top. The true satisfaction comes, however, from accomplishment of a predetermined goal. We did good this year, but others did better. We never have set out to be top entry (in the last few years), so if a lot of fun by all was the goal I guess we were sucessful.

⑦ Ham Operators Set Air Base Meeting

At least a part of the former Los Alamitos Naval Air Base will look like a gypsy camp this weekend, June 24-25, as members of the Orange County Amateur Radio Club join with twelve thousand other "hams" in a nationwide emergency test.

Club members will set up at least four two-way radio stations in tents. Electric power will be furnished by a gasoline-powered generator donated for the occasion.

The test, known as Field Day, is sponsored each year by the American Radio Relay League, national association of amateurs for the U.S. and Canada and runs for 27 hours, on a shift basis. The tents will provide cover for the operating equipment as well as sleeping quarters for off-duty amateurs. It is planned that another tent will be used for the kitchen.

The annual test is traditionally a team effort and along with club president Ron Cade, Cypress, the activities will be lead and directed by team captains Jack Hollander, Orange, Sam Goda, Orange, and Jim Keller, Cypress.

Over 50 club members are slated to take part, many of whom will bring their personal equipment while others will be on hand to donate their time and talents. The object is to train operators under difficult conditions such as might be encountered after a flood or earthquake and to test the equipment which would be used in such an emergency.

The group will carry on short conversations with as many other radio amateurs as possible. They hope to better their previous record by contacting well over 1,000 other stations. Last year most of the states as well as several foreign countries provided a good score in exchanging simulated emergency messages.

Those interested in amateur radio and club activities, are urged to inquire further by writing to the club at Box 95, Orange, Calif.

Wednesday, June 21, 1972

Buena Park News Independent

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2 Million Watt Transmitting Tube

—San Carlos, Ca.—The world's most powerful radio transmitting tube, a two million watt output tetrode with 17 decibels stage gain, has been developed by the EIMAC Division of Varian.

The 175-pound tube was developed for high-power transmitters that will be used by government broadcasters covering vast geographical areas. Two tubes can produce four megawatts CW.

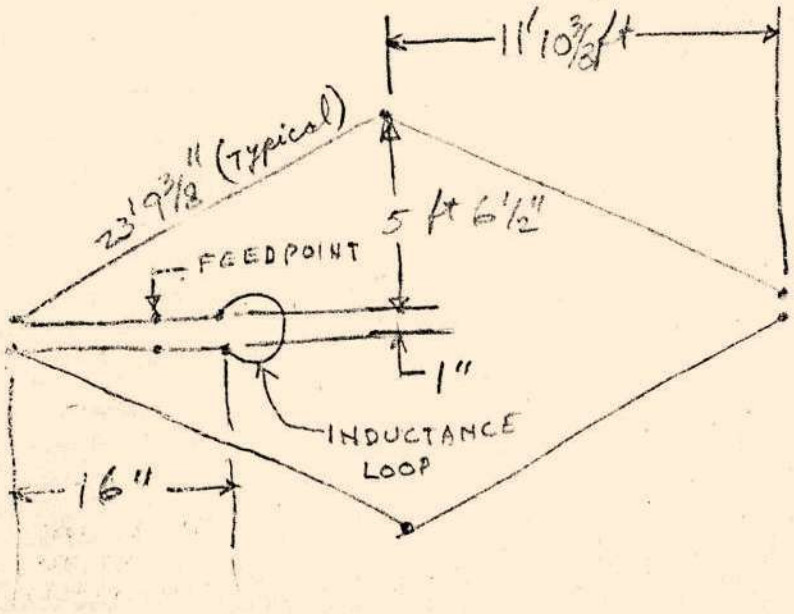
A switch, too? It can also be used as a 60-KV, 1,000-ampere switch, or as an ultrahigh power pulse modulator. The tube has a two-section, thoriated tungsten filament mounted on watercooled supports. Maximum anode dissipation rating is 1,250,000 watts steady state.

Weighing more than 175 lb., the tube generates more than two times the power of all the AM, FM and television stations in New York City.

The external dimensions are: height, 23 in.; anode cooler diameter, 11- 1/4 in.; and mounting base (screen terminal) diameter, 17 in. You can have one for your ham rig for $20,000, if you can sneak it past the FCC.

FIELD DAY ANTENNA FOR 2 METERS

Those who saw the 1972 OCARC field day 2 meter installation may be curious about the strange diamond shapped antenna perched atop the 40 foot mast. It's called the resonant rhombic. This particular design is two wavelengths on a side (there are 4 sides) and is roughly twenty five feet long and twelve feet high. It is bi-directional with a gain of approximately 10db. over a dipole and is vertically polarized. The antenna is constructed from two 1" x 2" x 12', one 2" x 2" x 12' and less than 100' of stranded copper antenna wire. It can be easily disconnected and stored when not in use. Dimensions and details of the antenna and feeding/matching system are given in the figure below. More details are available from Bill, WB6WOO.



Feed with 50 ohm coax. Adjust feedpoint and inductance loop length for lowest S.W.R.

# #

It appears that the above antenna could also be mounted horrizontally. Ed.

(9)

75¢ All-Purpose IC Timer

SUNNYVALE, CALIF. – Signetics Corp. has come up with an inexpensive universal timer in the form of an integrated circuit.

"Our compact new timer," said Arthur E. Fury, marketing manager, Signetics linear integrated circuit department, "will do almost anything that anyone ever wanted from a time-delay device of any kind. The typical time-delay relay with a 5% accuracy sells for about $15; but the 5% version of our timer sells for 75¢ each in lots of 100, available off-the-shelf. We have the added advantage in that our timer is absolutely silent." The initial version was designed by Hans Camenzind of Interdesign Inc.

The universal timer, known as Model 555, will produce fully controllable time delays between 1 microsecond and 1 hour. Allowed to run free, the timer can be set to oscillate at any frequency between 1 MHz and 1 pulse hour (which is 3.6 millihertz). The timer is internally compensated for component tolerances and temperature drifts. Externally, a resister and a capacitor are needed.

The timer is intended for many applications including automotive, home appliances, industrial control systems, electronic equipment; the timer can be used for simple time delay, time sequencing, pulse generation, missing pulse detection, frequency division, pulse width modulation and pulse position modulation.

The timer consists of two comparators, a flip flop and a buffered output stage. It's available in 8-pin metal or plastic packages.

Vendor contact: Signetics Corp., 811 East Arques Avenue, Sunnyvale, Calif. 94086. (408) 739-7700.

Make your own printed circuits – just add water and stir

TAKE YOUR CIRCUIT DESIGN, add water, and stir to make your own printed circuits with this new p-c board kit.

What makes it all possible is the development of a new material, called Acid Mask™, that protects metals from most common acids. The Acid Mask is coated onto the back of a sheet of paper and attached to a sheet of copper clad.

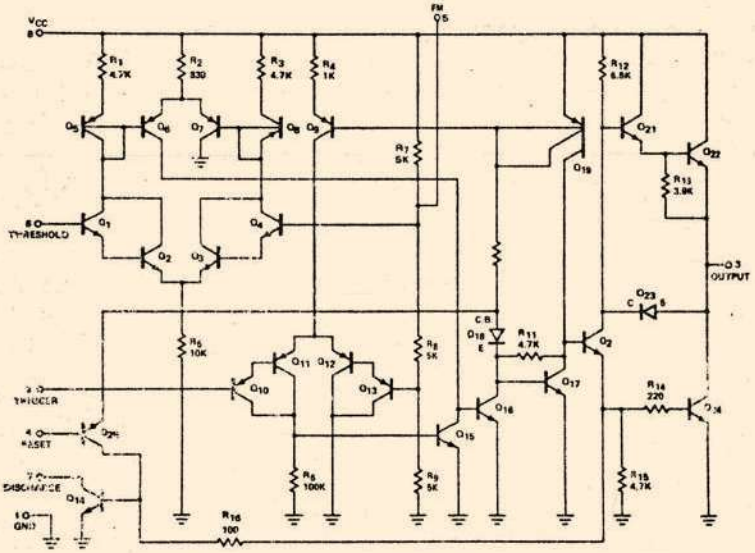
The complete printed circuit etching kit contains one epoxy-glass copper clad, 1 oz of copper on one side, clear plastic tracing sheet, Acid Mask sheet and protective sheet in one assembled unit; one Quad-Template — a light green transparent plastic template with logic symbols, schematic symbols, printed circuit board layout patterns and drill jig; Kandu Etchant™ — 6 oz of powdered ferric chloride, packaged in two poly bags suitable for etching the circuit, with a two piece Bag Lock™ closure strip, and mixing instructions. This is enough etchant to completely strip at least three 4" x 6" standard boards.

The kit also contains one 4H wooden drafting pencil, 6' of masking tape with peel strip, and a 4-page instruction sheet.

Price: Kit, $7.95 ea. **Avail:** Stock. **Mfr:** Kandu, Inc.

I.C. PROFILE

One of the newer I.C's to be announced is the Signetics universal timer, part designation 555 Timer (NE555V) This device sells for $1.13 ea and has been described in June 1972 QST. Repetative information will not be given here so be sure and read the article. The internal schematic of the chip is given below.



Schematic of 555 Timer

Applications of this 8 pin DIP device include timing from microseconds to one hour providing N.C. or N.O. output of up to 200 Ma., square wave generator of nearly crystal control stability from below 0.01 Hz to 1 MHz. , missing pulse detectors, frequency dividers, pulse width modulators, and pulse position modulators. The 555 will operate from 4.5 to 16 volts supply and draws only3 to 6 Ma. no load at 5 volts supply. As a squarewave generator output rise and fall time are 0.1 us maximum.

The timer can be triggered in a number of ways and is easy to get working. For applications information write for a data sheet/applications note from Art Fury, WA6JUJ, Signetics Corporation, 811 East Arques Ave., Sunnyvale, Ca. 94086. For sales contact their local sales office at (714) 453-7570.

SURPLUS CORNER

With the loss of Five Star, a convient source of low cost components no longer ixists in Santa Ana. The surplus business seems to be in a slump lately. Maybe too many people are on vacation or at the beach and are not buying surplus. Also their pocketbooks are being drained for summer activities. How is that for economic theory?

One source which is slowly growing is C.A. Hisserich, located adjacent to H.W. Wrights Hardware in Costa Mesa. Chuck doesn't handle a lot of components, but does have instruments and test equipment. He also carries accessories for test equipment. Present stock bargins include: Plug-ins for sweep generator HP-524, $15 for the 526B. $45 for 525A, $50 for the 525B. $10 for case. Formvar wire size #46 up $1.50 to 2.00 per spool. 19" racks, assorted with and without wheels.

K & M is consistantly growing. Bill has moved into the next section of his building and expanding his sphere of business. He now does semiconductor testing as well as selling. This gives an added confidence to the bargin hunter to know that the devices he has bought at low prices have been tested "in house".

BMC continues to offer bargins for the home brewer, but John hasn't gotten in any new lots lately. He has an item which would make a very good Christmas gift for just about anybody. It is an automatic nite light switch which screws into your porch lamp socket and turns on the light automatically when it gets dark. It will turn off the light again after it get light again. It has a delayed response so that headlights, etc. will not cause false operation of the lamp.

J & B hasn't received any new lot lately, but does get in a few items from time to time between the big lots.

If an "RF" readers know of any other Orange County surplus sources be sure and let the "RF" editor, or the Surplus Editor LeRoy Sparks, W6SYC know about them so that they can be checked out. There are two outlets in Costa Mesa which have to be checked out.

Have you ever wanted to build something and have the parts list refer to a 709 op-amp. What is that? If that strange name and part number is recognized as an IC just check the following IC guide to find out that Fairchild designed the ua709 and 12 other manufacturers copied it. The other manufacturers are called second sources, and their manufacturing the same device keeps the prices competitive.

Linear IC second source interchangeability guide

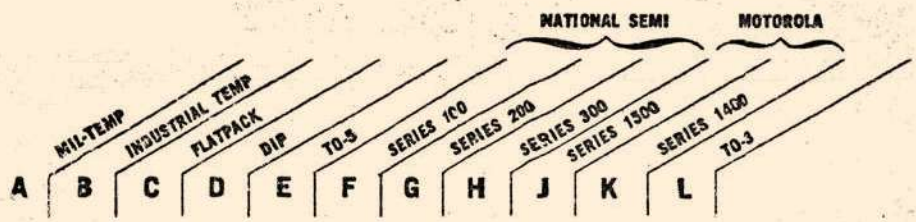
THIS GUIDE DIVIDES linear monolithic IC's into broad classifications: op amps, comparators, voltage regulators, and sense amplifiers. Consumer IC's are omitted because they are usually proprietary and cannot be applied to all designs.

Unlike electronic products* monthly Alternate Source, this guide lists exact equivalents and functional equivalents. Both exact second sources and functional equivalents must have the same pinout to qualify for this guide.

Section A lists original source op amps and replacements; Section B lists original source voltage comparators and replacements; Section C lists original source monolithic voltage regulators and replacements; and Section D lists original source sense amplifiers and replacements.

* July 17, 1972

For ease of reference, alphabetical designations have been assigned to the following temperature and packaging variations.



A-1 ANALOG DEVICES ORIGINATED OP AMPS

Second Source	Type No.	A	B	C	D	E
AD502 High-Z op amp			•			•
Intersil	AD502		•	•	•	•
Solitron	UC4502J		•	•	•	•
Transitron	TOA87/ 7741	•	•	•	•	•
AD503 FET-input op amp		•	•			•
Intersil	AD503	•	•	•	•	•
Solitron	UC4053		•	•	•	•
Teledyne-Philbrick	1421		•			•
AD505 High speed op amp			•			•
Intersil	AD505	•	•	•	•	•

A-2 BURR-BROWN ORIGINATED OP AMPS

Second Source	Type No.	A	B	C	D	E
3057		•				•
Sprague	ULN2139		•	•	•	•
Teledyne-Philbrick	1421		•			•
3500R op amp		•	•		•	•
Sprague	ULS2171	•		•	•	•
3501R op amp		•	•		•	•
Sprague	ULS2173	•		•	•	•
3053 FET input op amp		•	•			•
Sprague	ULS2139	•			•	•

A-3 FAIRCHILD ORIGINATED OP AMPS

Second Source	Type No.	A	B	C	D	E
μA702 Wideband op amp		•	•	•	•	•
Amperex	TAA241		•			•
RCA	CA3031/ 32	•	•			•
Raytheon	RM702	•	•	•	•	•
Texas Instruments	SN52/ 7202	•	•	•	•	•
μA709 Hi-performance op amp		•	•	•	•	•
ITT	MIC709	•	•		•	•
Microsystems Inter.	ML709	•	•	•	•	•
Motorola	MC1709	•	•	•	•	•
National Semi.	LM709	•	•		•	•
Nucleonic Products	LA709	•	•		•	•
Raytheon	RM709	•	•	•	•	•
Signetics	S/N5709	•	•	•	•	•
Solitron	UC4709	•	•	•	•	•
Teledyne Philbrick	1339	•	•		•	•
Teledyne Semi.	709	•	•	•	•	•
Texas Instruments	SN52/ 72709	•	•	•	•	•
Transitron	TOA17/ 2709	•	•	•	•	•
μA715 High-speed op amp		•	•		•	•
Advanced Micro Dev.	AM715	•	•	•	•	•
Harris Semi.	HA2515	•	•	•		•
Teledyne Semi.	1324	•	•	•	•	•

A-3 FAIRCHILD (cont'd)

Second Source	Type No.	A	B	C	D	E
μA725 Instrumentation op amp		•	•		•	•
Advanced Micro Dev.	AM725	•	•		•	•
Analog Devices	AD504		•			•
Analog Devices	AD508		•			•
Harris Semi.	HA2700	•	•		•	•
National Semi.	LM725	•	•		•	•
Precision Mono.	SSS725	•	•	•	•	•
Raytheon	RM725	•	•	•	•	•
μA739 Dual low-noise op amp			•		•	
Teledyne Semi.	739	•	•		•	•
Texas Instruments	SN76131		•		•	
μA740 FET-input op amp		•	•			•
Intersil	8740	•	•	•	•	•
National Semi.	LH740	•	•			•
Signetics	μA740	•	•			•
Solitron	UC4740	•	•	•	•	•
Teledyne Semi.	1421		•			•
μA741 Freq-comp op amp		•	•	•	•	•
Advanced Micro Dev.	AMD-μA741	•	•	•	•	•
Amperex	TBA221		•			•
Analog Devices	AD741	•	•			•
Harris Semi.	HA2107-3	•	•			
ITT	MIC741	•	•	•	•	

A-3 FAIRCHILD (cont'd)

Second Source	Type No.	A	B	C	D	E
Intersil	741	•	•	•	•	•
Microsystems Inter.	ML741	•	•	•	•	•
Motorola	MC741	•	•	•	•	•
National Semi.	LM741	•	•	•	•	•
Nucleonic Products	LA741	•	•		•	•
Precision Mono.	SSS741	•	•	•	•	•
Qualidyne	QC741	•	•	•		•
RCA	CA3741	•	•			•
Raytheon	RM741	•	•	•	•	•
Signetics	μA741	•	•		•	•
Silicon General	SG741	•	•	•	•	•
Solitron	UC4741	•	•	•	•	•
Sprague	ULN2151	•	•	•	•	•
Teledyne Philbrick	1339/ 1319	•	•		•	•
Teledyne Semi.	741	•	•	•	•	•
Texas Instruments	SN72741	•	•	•	•	•
Transitron	TOA1741	•	•	•	•	•

A-3 FAIRCHILD (cont'd)

μA747 Dual μA741		•	•		•	•
Advanced Micro Dev.	AMD-μA747	•	•	•	•	•
Microsystems Inter.	ML747	•	•	•	•	•
Motorola	MC1747	•	•		•	•
National Semi.	LM747	•	•	•	•	•
Precision Mono.	SSS747	•	•	•	•	•
RCA	CA3747	•	•		•	•
Raytheon	RM747	•	•	•	•	•
Signetics	μA747	•	•		•	•
Silicon General	SG747	•	•			•
Solitron	UC4747	•	•	•	•	•
Sprague	ULN2157/2747	•	•	•	•	•
Teledyne Semi.	747	•	•		•	•
Texas Instruments	SN52747/72747	•	•		•	
Transitron	TOA17/2747	•	•	•	•	•
μA748 Hi-performance op amp		•	•	•	•	•
Advanced Micro Dev.	AMD-μA748	•	•	•	•	•
Intersil	748	•	•	•	•	•
Microsystems Inter.	ML748	•	•	•	•	•
Motorola	MC1748	•	•	•	•	•
National Semi.	LM748	•	•		•	•
RCA	CA3748					•
Raytheon	RM748	•	•	•	•	•
Signetics	μA748	•	•		•	•
Silicon General	SG748	•	•		•	•
Solitron	UC4748	•	•	•	•	•
Sprague	ULN2158	•	•	•	•	•
Teledyne Semi.	748	•	•			•
Texas Instruments	SN52748/72748	•	•	•	•	•
Transitron	TOA17/2748	•	•	•	•	•
μA749 Dual op amp		•	•		•	•
Teledyne Semi.	749	•	•		•	

A-4 HARRIS SEMICONDUCTOR ORIGINATED OP AMPS

Second Source	Type No.	A	B	C	D	E
HA2500		•	•	•		•
Intersil	2500	•	•	•		•

A-4 HARRIS (cont'd)

Second Source	Type No.	A	B	C	D	E
HA2505		•	•	•		•
Intersil	2505	•	•	•		•
HA2515		•	•	•		•
Intersil	2515	•	•	•		•
HA2520		•	•	•		•
Intersil	2520	•	•	•		•
HA2600		•	•	•		•
Intersil	2600	•	•	•		•
HA2605		•	•	•		•
Intersil	2605	•	•	•		•
HA2615		•	•	•		•
Intersil	2615	•	•	•		•
HA2620		•	•	•		•
Intersil	2620	•	•	•		•
HA2535		•	•	•		•
Teledyne Philbrick	1322		•		•	•
HA2625		•	•	•		•
Teledyne Philbrick	1321		•		•	•
HA2705		•	•	•		•
Teledyne Philbrick	1323		•		•	•

A-5 NATIONAL SEMICONDUCTOR ORIGINATED OP AMPS

National Semiconductor specs its IC's in three series. Series 100 is −55° to 125°C, Series 200 is −25° to 85°C, and Series 300 is 0° to 70°C.

Second Source	Type No.	F	G	H	C	D	E
LM101/201/301 Op amp		•	•	•	•		•
Advanced Micro Dev.	AMD-LM101	•	•	•	•	•	•
Fairchild	LM101	•	•	•	•	•	•
Harris Semi.	HA2101	•	•	•	•		•
Intersil	LM101	•	•	•	•	•	•
Microsystems Inter.	ML101	•	•	•	•	•	•
Motorola	MLM101	•			•	•	•
Nucleonic Products	LA101	•	•	•			•
Precision Mono.	SSS101	•	•	•	•	•	•
RCA	CA3748	•	•	•			•
Raytheon	RM101	•	•	•	•	•	•
Signetics	LM101	•	•	•	•	•	•
Silicon General	SG101	•	•	•	•	•	•
Siliconix	LM101	•			•	•	•
Solitron	UC4101	•	•	•	•	•	•
Sprague	ULS2158	•	•	•	•	•	•
Teledyne Philbrick	1319	•					•
Teledyne Semi.	LM101	•	•		•	•	•
Texas Instruments	SN52748	•		•	•	•	•
Transitron	TOA 1741W	•		•	•	•	•

A-4 HARRIS (cont'd)

LM101A/201A/301A Op amp		•	•	•	•	•	•
Advanced Micro Dev.	AMD-LM101A	•	•	•	•	•	•
Analog Devices	AD101A	•	•	•			•
Intersil	101A	•	•	•	•	•	•
Microsystems Inter.	ML101A	•	•	•	•	•	•
Motorola	MLM101A	•			•	•	•
Nucleonic Products	LA101A	•	•	•			•
Precision Mono.	SSS 101A	•	•	•	•	•	•
Raytheon	RM101A	•			•	•	•
Signetics	LM101A	•		•	•	•	•
Silicon General	SG101A	•	•	•	•	•	•
Siliconix	LM101A	•	•	•	•	•	•

A-5 NATIONAL (cont'd)

Second Source	Type No.	F	G	H	C	D	E
Solitron	UC4101A	•	•	•	•	•	•
Texas Instruments	SN52101A	•		•	•	•	•
LM102/202/302 Volt follower		•	•	•	•		•
Advanced Micro Dev.	AMD-LM102	•	•	•	•	•	•
Intersil	LM102	•	•	•	•	•	•
Nucleonic Products	LA102	•	•	•			•
Silicon General	SG102	•	•	•	•	•	•
LM107/207/307 Comp. op amp		•	•	•	•	•	•
Advanced Micro Dev.	AMD-LM107	•	•	•	•	•	•
Fairchild	U5B 7741312	•	•	•	•	•	•
Harris Semi.	HA2107	•	•	•	•		•
Intersil	LM107	•	•	•	•	•	•
Microsystems Inter.	ML107	•	•	•	•	•	•
Motorola	MLM107	•	•	•	•	•	•
Nucleonic Products	LA107	•	•	•			•
Precision Mono.	SSS107	•	•	•	•	•	•
RCA	CA3741	•					•
Raytheon	RM107	•	•	•	•	•	•
Signetics	LM107	•		•		•	•
Silicon General	SG107	•	•	•	•	•	•
Solitron	UC4107	•	•	•	•	•	•
Teledyne Philbrick	1319	•	•			•	•
Teledyne Semi.	LM107	•					•
LM108 Op amp		•			•	•	•
Advanced Micro Dev.	AMD-LM108	•	•	•	•	•	•
Analog Devices	AD108	•	•	•			•
Harris Semi.	HA2700	•	•	•	•	•	•
Intersil	LM108	•	•	•	•	•	•
Microsystems Inter.	ML108	•	•	•	•	•	•
Nucleonic Products	LA108	•	•	•			•
Precision Mono.	SSS108	•	•	•	•	•	•
Raytheon	RM108	•	•	•	•	•	•
Signetics	LM108	•		•		•	•
Silicon General	SG108	•	•	•	•	•	•
Sprague	ULS2174	•	•	•	•	•	•
Teledyne Philbrick	1323	•	•	•	•	•	
Texas Instruments	SN52108	•		•			•

A-5 NATIONAL (cont'd)

LM108A/208A/308A Op amp		•	•	•	•	•	•
Advanced Micro Dev.	AMD-LM108A	•	•	•	•	•	•
Analog Devices	AD108A	•	•	•			•
Intersil	LM108A	•	•	•	•	•	•
Microsystems Inter.	ML108A	•	•	•	•	•	•
Nucleonic Products	LA108A	•	•	•			•
Precision Mono.	SSS108A	•	•	•	•	•	•
Raytheon	RM108A	•			•	•	•
Silicon General	SG108A	•	•	•	•	•	•
LM110/210/310 Volt follower		•			•	•	•
Advanced Micro Dev.	AMD-LM110	•	•	•	•	•	•
Fairchild	U5B-7741312	•	•	•			•
Intersil	LM110	•	•	•	•	•	•
Motorola	MLM 210/310				•	•	•

A-5 NATIONAL SEMI. (cont'd)

Second Source	Type No.	F	G	H	C	D	E
Raytheon	RM110	•			•	•	•
Silicon General	SG110	•	•	•	•	•	•
LM112/212/312 Super-beta op amp		•	•	•	•	•	•
Advanced Micro Dev.	AMD-LM112	•	•	•	•	•	•
Raytheon	RM112	•			•	•	•
LM216/316 Op amp			•	•			•
Advanced Micro Dev.	AMD-LM-216/316		•	•	•	•	•
Raytheon	RM116	•			•	•	•
LM216A/316A Op amp				•			•
Advanced Micro Dev.	AMD-216A/316A			•	•	•	•
LM118/218/318		•	•	•			•
Advanced Micro Dev.	AMD118	•	•	•	•	•	•
Raytheon	RM118	•					

A-6 MOTOROLA ORIGINATED OP AMPS

1400 Series is 0° to 75°C; 1500 Series is −55° to 125°

Second Source	Type No.	J	K	C	D	E
MC1430/1530 Op amp		•	•	•	•	•
Fairchild	U3F-7702312	•	•	•	•	•
MC1432/1533 Op amp		•	•	•	•	•
Fairchild	U3F 7101311	•	•	•	•	•
MC1436/1536 Op amp		•	•	•	•	•
Silicon General	SG1536/1436	•	•			•
MC1437/1537 Dual op amp		•	•		•	
Fairchild	UGA-7749393		•	•	•	•
Microsystems Inter.	ML1537/1437	•	•		•	
Raytheon	RM4709	•			•	
MC1439/1539 Op amp		•	•		•	•
Fairchild	U5B-7101392		•		•	•
Fairchild	U5B-7101311	•			•	•
Sprague	ULN2139/ULS2139	•	•	•	•	•
Teledyne Philbrick	1339	•	•			•
Transitron	TOA/2741	•	•	•	•	•
MC1456/1556 Op amp		•	•			•
Fairchild	U5T-7725393	•	•	•	•	•
Harris Semi.	HA2600/2605	•	•	•		•
Raytheon	RM1556	•			•	•
Signetics	N5556/S5556	•	•	•	•	•

A-6 MOTOROLA (cont'd)

Second Source	Type No.	J	K	C	D	E
Sprague	ULN/ULS-2156	•	•	•	•	•
Texas Instruments	SN52771	•		•	•	•
MC1458/1558 Op amp		•	•	•	•	•
Fairchild	U5F-7747393	•	•	•	•	•
Microsystems Inter.	ML1458/1558	•	•		•	•
National Semi.	LM1458/1558	•	•		•	•
Precision Mono.	SSS1458/1558	•	•	•	•	•
RCA	CA3458/CA3558	•				•
Raytheon	RM4588	•			•	
Signetics	N5558/S5558	•	•	•	•	•
Solitron	UC4458/4558	•	•	•	•	•
Teledyne Semi.	1458/1558	•	•	•	•	•
Texas Instruments	SN52558	•		•		•

A-7 RCA ORIGINATED OP AMPS AND LINEAR ARRAYS

Second Source	Type No.	A	B	C	D	E
CA3001 Differential amp		•				•
Fairchild	U5F-7733312	•				•
CA3018 Transistor array		•				•
Fairchild	CA3018	•				•
Lithic Systems	LA3018	•				•
Silicon General	SG3818				•	•
Sprague	ULN2018	•				•
CA3026 Dual differential amp		•				•
Fairchild	CA3026	•				•
Lithic Systems	LA3026	•				•
Silicon General	SG3822	•				•
Siliconix	SI3026	•				•
Sprague	ULN2026	•				•
CA3028 Differ (cascode) amp		•				•
Fairchild	U5Z-7703394	•				•
Lithic Systems	LS3028	•				•
National Semi.	LM3028	•				•
CA3036 Dual Darlington		•				•
Fairchild	CA3036	•				•
CA3045 Transistor array		•			•	
Fairchild	CA3045	•			•	
Lithic Systems	LA3045				•	
Microsystems Inter.	ML3045	•			•	
Siliconix	SI3045	•			•	
Sprague	ULS2045	•			•	
CA3046 Transistor array			•		•	
Fairchild	CA3046		•		•	
Lithic Systems	LA3046		•		•	

A-7 RCA (cont'd)

Second Source	Type No.	A	B	C	D	E
Microsystems Inter.	ML3046		•		•	
Silicon General	SG3821		•		•	
Siliconix	SI3046		•		•	
Sprague	ULN2046		•		•	
CA3049 Dual differential amp		•				•
Silicon General	SG3822	•				•
CA3053 Differ (cascode) amp		•				•
National Semi.	LM3053	•				•
CA3054 Dual differential amp			•		•	
Fairchild	CA3054		•		•	
Silicon General	SG3822		•		•	
Siliconix	SI3054		•		•	
Sprague	ULN2054		•		•	

B-1 FAIRCHILD ORIGINATED COMPARATORS

Second Source	Type No.	A	B	C	D	E
μA710 Differential comparator		•	•	•	•	•
ITT	MIC710	•	•	•		•
Motorola	MC1710	•	•	•	•	•
National Semi.	LM710	•	•		•	•
Nucleonic Products	LA710	•	•			•
Raytheon	RM710	•	•	•	•	•
Signetics	μA710	•	•		•	•
Silicon General	SG710	•	•	•	•	•
Solitron	UC4710	•	•	•	•	•
Teledyne Semi.	710	•	•	•	•	•
Texas Instruments	SN52/ 72710	•	•	•	•	•
Transitron	TDC17/ 2710	•	•	•	•	•
μA711 Dual differ comparator		•	•	•	•	•
ITT	MIC711	•	•	•		•
Motorola	MC1711	•	•	•	•	•
National Semi.	LM711	•	•		•	•
Nucleonic Products	LA711	•	•			•
Raytheon	RM711	•	•			•
Signetics	μA711	•	•			•
Silicon General	SG711	•	•			•
Solitron	UC4711	•	•			•
Teledyne Semi.	711	•	•			•
Texas Instruments	SN52/ 72711	•	•	•	•	•
Transitron	TDC17/ 2711	•	•	•	•	•

B-2 MOTOROLA ORIGINATED COMPARATORS

Second Source	Type No.	K	J	C	D	E
MC1414/1514 Comparator		•	•		•	
Fairchild	UGA- 7711393		•	•	•	•
Fairchild	UGA- 7711312	•			•	
National Semi.	LM1414/ 1514	•	•		•	

B-2 MOTOROLA (cont'd)

Second Source	Type No.	K	J	C	D	E
Raytheon	RM1514	•	•	•	•	
Texas Instruments	SN72/ 52514	•	•		•	
Transitron	TDC87/ 9711	•	•	•	•	

B-3 NATIONAL SEMICONDUCTOR ORIGINATED COMPARATORS

Second Source	Type No.	F	G	H	C	D	E
LM106/206/306 Volt comp		•	•	•	•		•
Advanced Micro Dev.	AMD106	•	•	•	•	•	•
Fairchild	U5B- 7710312	•			•		•
Fairchild	U5B- 7710393			•	•		•
Raytheon	RM106	•			•	•	
Texas Instruments	SN52106	•		•	•		•
LM111/211/311 Volt comp		•	•	•	•		•
Advanced Micro Dev.	AMD111	•	•	•	•	•	•
Fairchild	U5B- 7734312	•			•		•
Harris Semi.	HA2111	•		•	•	•	•
Intersil	LM111	•	•	•			
Microsystems Inter.	ML111	•	•	•	•	•	•
Raytheon	RM111	•				•	•

C-1 FAIRCHILD ORIGINATED VOLTAGE REGULATORS

Second Source	Type No.	A	B	C	D	E
μA723 Voltage regulator		•	•		•	•
Advanced Micro Dev.	AMD- μA723	•	•		•	•
Amperex	TAA281		•			•
ITT	MIC723	•	•			•
Intersil	723	•	•	•	•	•
Microsystems Inter.	ML723	•	•	•	•	•
Motorola	MC1723	•	•		•	•
National Semi.	LM723	•	•		•	•
Nucleonic Products	LA723	•	•		•	•
Raytheon	RM723	•	•	•	•	•

C-1 FAIRCHILD (cont'd)

Second Source	Type No.	A	B	C	D	E
Signetics	μA723	•	•		•	•
Silicon General	SG723	•	•	•	•	•
Solitron	UC4723	•	•	•	•	•
Sprague	ULN2741	•	•		•	•

C-2 NATIONAL SEMICONDUCTOR ORIGINATED VOLTAGE REGULATORS

Second Source	Type No.	F	G	H	C	D	E	L
LM100/200/300 Pos volt reg		•	•	•	•		•	
Intersil	ILM100	•	•	•	•	•	•	
Nucleonic Products	LA100	•	•	•			•	
RCA	CA3085A	•					•	
Silicon General	SG100	•	•	•	•	•	•	
Teledyne Semi.	LM100	•	•	•	•	•	•	
LM104/204/304 Neg volt reg		•	•	•	•		•	
Motorola	MLM104	•	•	•			•	
Nucleonic Products	LA104	•	•	•			•	
Raytheon	RM104	•					•	
Silicon General	SG104	•	•	•	•	•	•	
Teledyne Semi.	LM104	•	•	•			•	
LM105/205/305 Pos volt reg		•	•	•	•		•	
Advanced Micro Dev.	AMD-LM105	•	•	•	•	•	•	
Intersil	LM105	•	•	•	•	•	•	
Motorola	MLM105	•	•	•			•	
Nucleonic Products	LA105	•	•	•			•	
Raytheon	RM105	•					•	
Silicon General	SG105	•	•	•	•	•	•	
Teledyne Semi.	LM105	•	•	•		•		
LM109/209/309 Pos 5-v reg		•	•	•			•	•
Fairchild	LM109	•	•	•				•
Motorola	MLM109	•	•	•				•
Nucleonic Products	LA109	•	•	•				•
Raytheon	RM109	•					•	•
Signetics	LM109	•		•			•	•
Silicon General	SG109	•	•	•			•	•
Teledyne Semi.	LM109	•	•	•			•	•

D TEXAS INSTRUMENTS ORIGINATED SENSE AMPLIFIERS

Second Source	Type No.	A	B	C	D
SN7520/21 Dual channel sense amp			•		•
Motorola	MC-7520/21		•		•
National Semi.	LM-7520/21		•		•
Raytheon	RM-7520/21	•	•		•
Signetics	N7520/21		•		•
Silicon General	SG-7520/21		•		•
SN7522/23 Dual channel sense amp			•		•
Motorola	MC-7522/23		•		•
National Semi.	LM-7522/23		•		•
Raytheon	RM-7522/23	•	•		•
Signetics	N7522/23		•		•
Silicon General	SG-7522/23		•		•
SN7524/25 Dual sense amp			•		•
Fairchild	SN-7524/25		•		•
Motorola	MC-7524/25		•		•
National Semi.	LM-7524/25		•		•
Raytheon	RM-7524/25	•	•		•
Signetics	N7524/25		•		•
Silicon General	SG-7524/25		•		•
Siliconix	Si55/7524/25	•	•		•
SN7528/29 Dual sense amp			•		•
National Semi.	LM-7528/29		•		•
Silicon General	SG-7528/29		•		•

HP-35A PROBLEM

$\cos \pi = -1$ (π is radians)

$i = \sqrt{-1}$ $\quad -1 + [(\sqrt{-1})(0)] = -1 + 0 = -1$

$\sin \pi = 0$

$e^{i\pi} + 1 = -1 + 1 = 0 \quad \therefore \underline{q = 0}$

$e^{i\pi} + 1 = 0$ Euler

N O T I C E

The OCARC will hold its July membership meeting on July 21, 1972 at 7:30 PM at the Mercury Savings and Loan, at 1095 Ervine (4th) Blvd. in Tustin in the Mercury Room. This may or may not be our permanate meeting place.

JULY PROGRAM - Telephone Data Communications by Ken Konechy, W6HHC, Product Developement Manager for PERTEC Business Systems. Acustical Couplers, Modems, etc. will be discussed.

I N S I D E

I.C. Substitutions and second sources

I.C. Universal Timer, Signetics 555 reviewed under I.C. Profile.

Field Contacts tabulated

Simple to build, hi gain (10 db.) 2 Meter Antenna